

PATENT ABSTRACTS OF JAPAN

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(54) RAPID DEVELOPING METHOD OF COLOR MATERIAL

(57)Abstract:

PURPOSE: To enable rapid development of a silver halide recording material by treating the photographic material with a developer or a soln. I of its salt and then subjecting the photographic material impregnated with the developer to the treatment with an alkali-contg. soln. II.

CONSTITUTION: The photographic material has photosensitive silver halide emulsion layers having at least three different spectral photosensitivities on a base body, and the cyan coupler, magenta coupler and yellow coupler in the layers are spectrally continuous. The recording material is exposed for an image and treated with a developer or its salt soln. I under the condition of pH1 to 8 for 1 to 10sec. The photographic material impregnated with the developer is treated with an alkali-contg. soln. II under the condition of pH10 to 14 for 1 to 10sec. for development. Thereby, partial images of cyan, magenta and yellow are formed and combined to give a final color image. Thus, rapid development of a color photographic material is realized.

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⑮ 発明の名称 カラー材料の迅速現像方法

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明 細 書

1. [発明の名称]

カラー材料の迅速現像方法

2. [特許請求の範囲]

1. シアンカブラー、マゼンタカブラー及び黄カブラーがそれぞれスペクトル的に適合されている少なくとも三つの異なるスペクトル感光性を有する感光性ハロゲン化銀乳剤層を層支持体上に含有する画像的に露光されたハロゲン化銀記録材料を次の処理段階:

(1) 写真材料の現像剤またはその塩の溶液 I による、pH 1~8 における 1~10 秒間の処理、

(2) 現像剤で含浸された写真材料のアルカリ-含有溶液 II による、pH 10~14 における 1~10 秒間の処理、

に付することを特徴とするハロゲン化銀記録材料の迅速現像方法。

3. [発明の詳細な説明]

本発明は塩化銀高含量の写真材料の迅速現像に特に適した方法に関する。

本発明を要約すれば、シアンカブラー、マゼンタカブラー及び黄カブラーがそれぞれスペクトル的に適合されている少なくとも三つの異なるスペクトル感光性を有する感光性ハロゲン化銀乳剤層を層支持体上に含有する、画像的に露光されたハロゲン化銀記録材料を次の処理段階:

(1) 写真材料の現像剤またはその塩の溶液 I による、pH 1~8 における 1~10 秒間の処理、

(2) 現像剤で含浸された写真材料のアルカリ-含有溶液 II による、pH 10~14 における 1~10 秒間の処理、

に付することから成る迅速現像方法であって、これはさもなければ45秒間以上の常用の現像によってのみ得られる種類の最大カラー密度を生成する。

現像剤酸化生成物とカブラー分子との画像的カブリングによるカラー写真画像の形成はよく知られている。この方法において、シアン、マゼンタ及び黄の部分画像が通常生成され、それが組合わさって最終カラー画像が形成される。現像剤は一般に一級芳香族アミノ化合物でありこれは変換さ

(2)

れて現像剤酸化生成物を露光されたハロゲン化銀の領域中に形成する。

用いるハロゲン化銀は臭化銀、臭化沃化銀、塩化銀、塩化臭化銀及び塩化臭化沃化銀であり、塩化物高含量のハロゲン化銀乳剤または純粋な塩化銀乳剤でさえもカラーネガ紙用に飽えず増大して適用されてきており、その理由はそのような塩化物高含量の乳剤は多くの有利な性質を有するからである。即ちそれらの可視光線に対する低い固有感度は、例えばネガフィルムまたは反転フィルムの如き高感度材料において欠くことのできない黄フィルター層なしの材料を製造するのに利用することを可能ならしめる。その上、塩化物の高含量を含有するハロゲン化銀乳剤の使用は、現像所要時間を著しく低減させ、それは現像の間に放出される塩化物イオンは臭化物イオンの如き抑制的効果を有しないからである。

塩化物含量>95モル%のハロゲン化銀乳剤を臭化物のないカラー現像浴と組合せて使用することによりカラー紙の現像時間を210秒から45

2. 現像剤の濃度が上方にある層による消費に基づき十分に高くない。

3. 層Ⅲへの現像剤と同時に到達するところの層Ⅰ及びⅡからのハライドの多量の存在はそれに相応して現像工程に抑制効果を有する。

これらの不利は極度に短かい現像時間(例えば<20秒)による迅速処理操作において特に認められそして常法による現像を、不可能ではないにせよ、一層困難ならしめる。

今回、一つの特種の現像方法が上記不利を克服するばかりではなく実用上における付加的利点をも与えることが見出された。

本発明は、シアノカプラー、マゼンタカプラー及び黄カプラーがそれぞれスペクトルの適合されている少なくとも三つの異なるスペクトル感光性を有する感光性ハロゲン化銀乳剤層を層支持体上に含有する、画像的に露光されたハロゲン化銀材を次の処理段階：

(1) 写真材料の現像剤またはその塩の溶液Ⅰによる、pH1~8における1~10秒間の処理、

秒へ短縮することを可能ならしめた(RA4法、コダック2001紙)。

またアダプア95CD型の高活性現像剤の使用によって臭化銀乳剤に基づく常用のカラー紙で同じ現像時間を達成することも可能になった。

さらに現像時間を短縮することは、望ましくそして是非考えたいところであるけれども、これは用いられる現像系における固有の要因によって制限される。

写真材料が高活性の現像溶液中に浸漬されるときのカラー材料の一番上のカラー層の現像は直ちに開始される。ハロゲン化銀の還元の際に放出されるハライドは現像溶液と共に下層にある乳剤層中へ浸透しそしてその現像を妨げる。異なるスペクトル感光性の三つのハロゲン化銀乳剤層を含有する材料の第三のそして一番底部の乳剤層はこの工程において特に妨害される。

この層の現像の効果は次の三つの要因によって遅延される：

1. 現像剤の拡散通路が一番長い。

(2) 現像剤で含浸された写真材料のアルカリ含有溶液Ⅱによる、pH10~14における1~10秒間の処理、

に付することから成る迅速現像方法に関する。

上記した二つの浴を用いる全体の現像時間は、かくして45秒よりも著しく短かい。現像剤を含む第一の浴においてpH値は低くそのため現像が起らないかまたは小さい程度の現像しか起らず、かくして現像剤が何ら現像工程で阻害されることなく写真材料の一番下の層中へ拡散することを可能ならしめる。第二の浴はpH値を増大させるためアルカリを含有する；ヒドロキシルイオンの迅速な拡散に基づき現像はすべての層中で同時に開始されうる。

現像剤溶液ⅠのpH値は好ましくは3.5~6.5である；現像剤溶液Ⅱのそれは12~14である。

極度に短かい現像時間に加えて、上記した種類の現像浴の使用はまた現像剤溶液Ⅰの実用的に制限されない安定性に関して利点を有し、なぜなら

低いpH値において、自動酸化を促進する空気中の酸素の影響は大きい程度に排除されるからである。さらに別の利点は、この迅速現像法が使用する溶液I及びIIの濃度に殆ど完全に無関係であること、及び事実上蒸留のない操作方式を提供すること、に見出されるべきである。

二つの溶液を用い写真材料を非常に短い時間で処理する観点からして、握めったローラーまたは加圧シリンダーによるいわゆる単一適用を実施することもまた可能である。

アルカリ浴として例えばNaOH、KOH、焼碱三カリウムまたはこれら物質の混合物を用いることができる。

或る場合には、ハロゲン化銀の溶解液に影響を及ぼす物質例えばKCl、KBr、KIまたは安定剤の少量を溶液Iに添加することによって感光性結果を調整するのが適当である。

本発明方法を連続操作方式で用いる場合、溶液の乳剤層への浸透を促進またはゼラチン及び水中に存在するカルシウムイオンを遮断するところ

1-ジホスホン酸もまた鉄錯化剤として作用する。

鉄錯化剤を二つの現像剤溶液に加えることも有利である。

特殊の鉄錯化剤は例えば4, 5-ジヒドロキシ-1, 3-ベンゼンジスルホン酸、5, 6-ジヒドロキシ-1, 2, 4-ベンゼントリスルホン酸及び3, 4, 5-トリヒドロキシ-安息香酸である。

カルシウムを錯化するには現像剤1モル当り好ましくは約0.2〜約1.8モルのカルシウム錯化剤が用いられる。

鉄錯化剤は現像剤1モル当り約0.02〜約0.2モルの量で用いられる。

特に適当な一般芳香族アミノ現像剤はp-フェニレンジアミンであり、特にアルキル基及び芳香族基が置換されているかまたは置換されていないN, N-ジアルキル-p-フェニレンジアミンである。そのような化合物の例はN, N-ジエチル-p-フェニレンジアミン塩酸塩、4-N, N-ジエチル-2-メチル-p-フェニレンジアミン

(3)の還元剤及び錯化剤を溶液I及びIIへ添加することともまた有利である。

カルシウムイオンを錯化するため適当な錯化剤は例えばそれ自体よく知られているアミノポリカルボン酸である。そのようなアミノポリカルボン酸の典型的な例はニトロトリ酢酸、エチレンジアミンテトラ酢酸(EDTA)、1, 3-ジアミノ-2-ヒドロキシ-プロピルテトラ酢酸、ジエチレントリアミンペンタ酢酸、N, N'-ビス-(2-ヒドロキシベンジル)-エチレンジアミン-N, N'-ジ酢酸、ヒドロキシエチルエチレンジアミントリ酢酸、シクロヘキサンジアミノテトラ酢酸及びアミノ-マロン酸である。

その他のカルシウム錯化剤はポリホスフェート、ホスホン酸、アミノポリホスホン酸及び加水分解されたポリマレイン酸無水物例えばナトリウムヘキサメタホスフェート、1-ヒドロキシエタン-1, 1-ジホスホン酸、アミノトリスメチレン-ホスホン酸及びエチレンジアミンテトラメチレン-ホスホン酸である。1-ヒドロキシエタン-1,

塩酸塩、4-(N-エチル-N-2-メタンスルホニルアミノエチル)-2-メチル-p-フェニレンジアミンセスキ硫酸塩-水加物、4-(N-エチル-N-2-ヒドロキシエチル)-2-メチル-p-フェニレンジアミン硫酸塩及び4-N, N-ジエチル-2, 2'-メタンスルホニルアミノエチル-p-フェニレンジアミン塩酸塩である。

好ましくは現像剤は5〜100g/l、特に5〜30g/lの量で適用される。

更に白色化剤、白カプラー及び抗酸化物質を添加することが適当でありうる。適当な抗酸化剤は例えばヒドロキシルアミン及びジエチルヒドロキシルアミンならびに亜硫酸塩であり、これらは好ましくは5g/lまでの量で用いられる。

適当な付加的成分は光学的光輝剤、滑剤例えばポリアルキレングリコール、表面活性剤、安定剤例えば炭素黒メルカプト化合物またはニトロベンズイミダゾール、及び所要のpH値を形成するための剤である。現像剤溶液はまた5gより少ないベンジルアルコールを含むこともできる；好まし

(4)

くはそれはベンジルアルコールを何ら含まない。

上記した迅速現像法に付される写真記録材料のハロゲン化銀乳剤層は塩化銀を少くとも80、好ましくは少くとも95モル%含有すべきである。

シアンカプラーを含む層は通常赤感光性であり、マゼンタカプラーを含む層は通常緑感光性でありそして黄カプラーを含む層は通常青感光性である。

迅速現像法に適當な温度は20~40℃の範囲内にある。

直ぐに使用できる溶液は各個成分から、または各個成分が相当高濃度に溶けているいわゆる濃化物から調製することができる。濃化物は、いわゆる補充液即ち各個成分の濃度が直ぐに使用できる溶液におけるよりも幾分高い液を、それから調製しうるように調製される。この補充液は一方では直ぐに使用できる溶液の調製用に使用することができ、そのためには更に希釈しそして開始剤好ましくはKCIが添加され、または他方では現像工程中に消費されまたは塩流の結果としてもしくは現像された材料に随伴して排出される化学薬剤を

使用中の現像剤溶液に補充するために使用することができる。クロライドイオンは通常新たに調製される現像剤の場合を除いては添加することは要せず、それはクロライドイオンは通常現像の結果として写真材料から遊離されるからである。

本発明による現像剤の助けにより、その感光性乳剤層が少くとも80モル%の濃化物を含むハロゲン化銀粒子を含有するカラー写真ネガ紙を20秒以内に最大40℃の温度で現像することが可能であり、生成される画像はすぐれた品質を有しそして同じカラーネガ紙からRA-4法により45秒で得られるものと同等である。特にカラーの光安定性に関して何ら損ることがない。

全体の現像時間は好ましくは10秒以下である。

現像の後写真材料は常法により停止され、漂白され、定着され、洗滌されそして乾燥されるが、漂白一定着操作中で漂白及び定着を続けそして洗滌工程を安定化浴で置きかえることが可能である。また漂白浴または漂白一定着浴が十分に酸性であるならば停止浴を省略することもできる。

実 施 例

比較の現像：

濃化物乳剤に基づく市販の常用カラー紙、例えばコダック2001またはアグファカラー・タイプ9をRA4法の仕様に従い現像し、次いで漂白一定着しそして洗滌する。

処理は次のようにして行なわれた：

現像： 45秒、35℃

漂白一定着浴： 45秒、35℃

洗滌： 90秒、30℃

乾燥。

浴組成

現像液：

トリエタノールアミノ 11.0g

N,N-ジエチルヒドロキシル

アミン 5.1g

4-アミノ-N-エチル-N(β-

メタンスルホンアミドエチル)-

α-トルイジン-セスキ硫酸塩-

水化物 5.0g

塩化カリウム 2.3g

エチレンジアミンテトラ酢酸 3.0g

3,4-ジヒドロキシ-1,2,5-ベンゼン-

トリスルホン酸、

三ナトリウム塩 0.6g

炭酸カリウム 25.0g

その他常用の表面活性剤及び

光学的光輝剤。

水を加えて1ℓとする、pH=10.04

漂白一定着浴：

ナトリウムジサルファイト 15g

アンモニウムチオサルファート 100g

アンモニウム酸エチレン

ジアミンテトラ酢酸 50g

エチレンジアミンテトラ酢酸 5g

混合物を1ℓとする、pH=8.0

現像のみに45秒を要した処理後、次の最大密度が得られる：

黄 243

マゼンタ 247

シアン 249

本発明による現像

上記比較試験におけると同じ写真材料を用いる
; RA-4 現像で処理する代りに、先ず5 間、
30℃で次の溶液 I を用いて処理する:

ナトリウムサルファイト

4-アミノ-N-エチル-N-(β-

メタンスルホンアミドエチル)-

m-トルイジンセスキ硫酸塩一本化物 20g

水を加えて1,000 ml とする、pH=5.0

次に材料を次記組成の溶液 II に3 秒間、30℃
で付する:

磷酸三カリウム 50g

水酸化カリウムでpH 13 に調整

水で1,000 ml とする、pH=13

次に停止を2 秒間行ないそして常法により処理
を続ける。

最大密度:黄 240

マゼンタ 265

シアン 247

乳剤層が少なくとも80モル%の塩化物を含有する
上記第1項記載の方法。

3. 現像されるべき写真材料のハロゲン化銀乳剤
層が少なくとも95モル%の塩化物を含有する上
記第1項記載の方法。

4. 現像が最大20秒間内に完了される上記第1
項記載の方法。

5. 現像が最大10秒間内に完了される上記第1
項記載の方法。

6. 現像剤溶液 I がベンジルアルコールを含まない
上記第1項記載の方法。

7. 二つ現像液中において現像が20~40℃範
囲内の温度で行われる上記第1項記載の方法。

8. 現像剤が5~100g/l の量で適用される
上記第1項記載の方法。

(5) 二つの現像工程の比較は、本発明による現像が
僅か8秒間の全体現像時間中に所要の最大密度を
有効に生成すること及び得られる値がRA-4 法
による値よりも或る程度高いことを明らかに示し
ている。

本発明の主たる特徴及び利便性は以下の通りであ
る。

1. シアNCブルー、マゼンタブルー及び黄カ
ブルーがそれぞれスペクトル的に適合されている
少くとも三つの異なるスペクトル感光性を有する
感光性ハロゲン化銀乳剤層を層支持体上に含有す
る、図像的に露光されたハロゲン化銀記録材料を
次の処理段階:

(1) 写真材料の現像剤またはその塩の溶液 I
による、pH 1~8 における1~10 秒間の処理、

(2) 現像剤で含浸された写真材料のアルカリ
-含有溶液 II による、pH 10~14 における1
~10 秒間の処理、

に付することから成る迅速現像方法。

2. 現像されるべき写真記録材料のハロゲン化銀

特許出願人 アグファ・グヴェルト・
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(54) METHOD FOR PROCESSING SILVER HALIDE PHOTOGRAPHIC SENSITIVE MATERIAL AND DEVELOPER
USED THEREFOR

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a silver halide photographic sensitive material processing method by capable of obtaining a high density image having low fog rapidly even at the time of supplying the a small amount of developer with a dry feeling similar to that in a dry process and being stably and rapidly processed without causing any precipitation in a processing solution even at the time of processing a small amount of the sensitive material and even under any circumstances.

SOLUTION: This developer consists of at least two processing solutions, namely a concentrated processing solution having a pH of ≤ 7 and another concentrated processing solution having a pH of ≥ 8 and respectively prescribed amounts of these solutions are supplied to the image forming surface of the sensitive material to develop the sensitive material. Also, the developer consists of at least two processing solutions, namely a concentrated processing solution having a pH of ≤ 7 and another concentrated processing solution having a pH of ≥ 8 and respectively prescribed amounts of these processing solutions are supplied to the image forming surface of the sensitive material to directly mix the processing solutions together on and/or within the photographic image forming layers.

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CLAIMS

[Claim(s)]

[Claim 1] The art of the silver-halide photosensitive material characterized by for the processing liquid for development consisting of at least two, pH seven or less strong solution and pH eight or more strong solutions, and carrying out specified quantity supply and developing each processing liquid for development to the image formation side of silver-halide photosensitive material.

[Claim 2] The art of a silver-halide photosensitive material according to claim 1 to which the amount of supply of seven or less above [pH] liquid and pH eight or more liquid is characterized by being 5-150ml per two 1m of silver-halide photosensitive material, respectively.

[Claim 3] The art of a silver-halide photosensitive material according to claim 1 or 2 characterized by seven or less above [pH] liquid containing 0.005-1.00 mols /of color development chief remediesl.

[Claim 4] The art of a silver-halide photosensitive material according to claim 1, 2, or 3 characterized by eight or more above [pH] liquid containing 0.1-3.5 mols /of alkali chemicalsl.

[Claim 5] The art of a silver-halide photosensitive material according to claim 1, 2, 3, or 4 characterized by supplying either [at least] seven or less above [pH] liquid or pH eight or more liquid to the image formation side of silver-halide photosensitive material through space.

[Claim 6] The art of a silver-halide photosensitive material according to claim 5 characterized by supplying the both sides of seven or less above [pH] liquid and pH eight or more liquid to the image formation side of silver-halide photosensitive material through space.

[Claim 7] The art of a silver-halide photosensitive material according to claim 1, 2, 3, 4, 5, or 6 to which one liquid is characterized by the ratio of the capacity of seven or less above [which is supplied to the image formation side of silver-halide photosensitive material / pH] liquid and pH eight or more liquid being less than 100 times to the liquid of another side.

[Claim 8] The art of a silver-halide photosensitive material according to claim 1, 2, 3, 4, 5, 6, or 7 characterized by time after the 1st liquid of the processing liquid for development is supplied to the image formation side of silver-halide photosensitive material until this sensitive material results in the following down stream processing being 5 - 45 seconds.

[Claim 9] The development agent of the silver-halide photosensitive material which consists of at least two, pH seven or less strong solution and pH eight or more strong solutions, and specified quantity supply is carried out in the image formation side of silver-halide photosensitive material, respectively, and is on a photograph composition layer and/or among a photograph composition layer, and is characterized by mixing directly.

[Claim 10] The development agent of a silver-halide photosensitive material according to claim 9 characterized by seven or less above [pH] liquid containing 0.005-1.00 mols /of color development chief remediesl.

[Claim 11] The development agent of a silver-halide photosensitive material according to claim 9 or 10 characterized by eight or more above [pH] liquid containing 0.1-3.5 mols /of alkali chemicalsl.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] About the development agent used for the art of silver-halide photosensitive material, and it, this invention is quick processing of dry feeling in detail, and the picture of high concentration and low fogging is acquired, and it relates to the development agent used for the art of silver-halide photosensitive material and it which are excellent also in the shelf life of processing liquid.

[0002]

[Description of the Prior Art] In the field of processing of silver-halide color photography sensitive material (henceforth sensitive material), the request of speeding up of processing is increasing increasingly.

[0003] On the other hand, since it corresponds to waste fluid regulation in recent years, also in the so-called mini-laboratory, low supplement-ization is advancing. For this reason, in a mini-laboratory with few throughputs per day, it is in the inclination for the update rate of processing liquid to fall, especially the color development liquid high-concentration-ized for quick processings tends to receive air oxidation, and it is easy to produce the problem of it becoming impossible to maintain the deposit of sedimentation, generating of tar, and the processability ability further stabilized by degradation of liquid. On the other hand, although mode of processing of the method which encloses color development liquid with the good container of sealing nature, and is sprayed is indicated by JP,6-324455,A in order to prevent air oxidation, development property sufficient with this technology is not acquired, but there is no **** in practical use.

[0004]

[Problem(s) to be Solved by the Invention] By the way, a mini-laboratory store increases quickly in recent years, and waste fluid is not generated, but an unfamiliar person also has the needs for the processing system which can be used easily in the treatment of the device of the dry feeling in which it does not impress using processing liquid. Moreover, no matter it may install some outdoors, such as change of atmospheric temperature, etc. in what environment, a system which can be processed stably is also desired.

[0005] Although it has succeeded in the attempt which supplies a developer to the image formation side (it is also called an emulsion side) of sensitive material directly, and keeps developer composition constant in order to acquire processing stability. The well-known direct supplying method is what supplies comparatively a lot of developers to an emulsion side. Not all the developers to supply permeate into sensitive material, liquid sagging occurs, therefore the amount of supply of processing liquid needs to be little to the grade which does not start liquid sagging, when aiming at dry feeling also at processing stability.

[0006] However, it is difficult to elute halogenide ion from sensitive material, to become high concentration especially if there is little processing liquid, to suppress advance of a development reaction as silver development advances, when it is color development processing, and to obtain required concentration by short-time processing, and it is difficult to use the color development liquid used now as it is.

[0007] Although it is possible to warm sensitive material in order to promote a development reaction, if an elevated temperature is applied from the exterior, fogging will occur. Moreover, even if it warms processing liquid, temperature of sensitive material cannot be enough raised by the few amount of supply. Furthermore, if processing liquid is warmed, oxidization of a developing agent will tend to take place, and generating of tar or precipitation will be caused.

[0008] Even if this invention is made in view of the above-mentioned situation and the purpose makes [1st] a developer little supply of dry feeling, it is quick and the processing from which the picture of high concentration and low fogging is acquired is possible, and it is in offering the art of the silver-halide photosensitive material which does not produce the problem of precipitation generating of processing liquid. Moreover, it is in providing the 2nd with the art of the silver-halide photosensitive material which can perform stable quick processing no matter it may be processed in what environment, even if a throughput is little.

[0009]

[Means for Solving the Problem] As for the above-mentioned purpose of this invention, the processing liquid for ** development consists of at least two, pH seven or less strong solution and pH eight or more strong solutions. The art of the silver-halide photosensitive material which carries out specified quantity supply and develops each processing liquid for development to the image formation side of silver-halide photosensitive material, The amount of supply of seven or less above [pH] liquid and pH eight or more liquid is 5-150ml per two 1m of silver-halide photosensitive material, respectively, Seven or less above [pH] liquid contains 0.005-1.00 mols /of color

development chief remedies. Eight or more above [pH] liquid contains 0.1–3.5 mols /of alkali chemicals. Either [at least] seven or less above [pH] liquid or pH eight or more liquid is supplied to the image formation side of silver-halide photosensitive material through space. The both sides of seven or less above [pH] liquid and pH eight or more liquid are supplied to the image formation side of silver-halide photosensitive material through space. The ratio of the capacity of seven or less above [pH] liquid and pH eight or more liquid is [one liquid] less than 100 times to the liquid of another side. Time after the 1st liquid of the processing liquid for development is supplied to the image formation side of silver-halide photosensitive material until this sensitive material results in the following downstream processing is 5 – 45 seconds. And it consists of at least two, a with a ** pH of seven or less strong solution and pH eight or more strong solutions. Specified quantity supply is carried out in the image formation side of silver-halide photosensitive material, respectively. The development agent of the silver-halide photosensitive material which is on a photograph composition layer and/or among a photograph composition layer, and is mixed directly, and seven or less above [pH] liquid contain 0.005–1.00 mols /of color development chief remedies. It is attained more by that eight or more above [pH] liquid contains 0.1–3.5 mols /of alkali chemicals.

[0010] That is, this invention person used to divide the processing liquid for development into a strong solution with low pH, and a strong solution with high pH, he used to supply each liquid to the image formation side of sensitive material, regulating an amount, used to think that a development reaction will be promoted using the heat of neutralization which generates both liquid by being on the image formation side of sensitive material, and/or among a photograph composition layer, and mixing directly, and used to result in this invention. When it is an object for the color developments for color sensitive material, as for the processing liquid for development, it is effective to make low pH liquid contain a color development chief remedy by the concentration of 0.005–1.00 mols/L, to high-concentration-ize, to make high pH liquid contain alkali chemicals by the concentration of 0.1–3.5 mols/L, and to be referred to as high concentration and high pH.

[0011] Now, consider as 2 liquid system divided into the solution of low pH which contains a color development chief remedy for color development liquid, and the solution containing alkali chemicals of high pH, and sensitive material is made to flood with each liquid one by one, or liquid is given to JP,2-203338,A with a roller, the permeability of a color development chief remedy is raised, and quickening processing of a color paper is indicated. However, since time is set and alkali chemicals are supplied after supplying a color development chief remedy, this method is in the start of a development reaction, and it is inadequate. [of the effect of development promotion]

[0012] Hereafter, this invention is explained in full detail for every item.

[0013] [Silver-halide photosensitive material] As an example of the sensitive material processed by the method and processing agent of this invention, the silver-halide color photography sensitive material containing chloride emulsion and the silver-halide color photography sensitive material containing iodine silver bromide or a silver-bromide emulsion are mentioned. Generally such sensitive material comes to prepare the photograph composition layer which consists of hydrophilic-colloid layers, such as photosensitive emulsion layers, such as a blue-sensitive silver-halide emulsion layer, a green sensitivity silver-halide emulsion layer, and a red-sensitive silver-halide emulsion layer, an antihalation layer, an interlayer and a filter layer, and a protective layer, on the base material which makes a resin and paper a base. The development agents of this invention are on these photograph composition layers and/or among a photograph composition layer, and it is mixed directly and they function.

[0014] [Processing liquid supply] In this invention, it is desirable to supply either [at least] pH seven or less strong solution or pH eight or more strong solutions through space. It says making not a form like processing by the usual auto-processor by minding space that makes sensitive material completely immersed in the bath of processing liquid but processing liquid fly here to the image formation side of sensitive material, or applying processing liquid to it using a curtain coating machine or sponge.

[0015] A processing liquid flight means to make processing liquid fly through space as a concrete processing liquid supply means to sensitive material, a processing liquid application means to apply processing liquid to sensitive material through space like a curtain coating machine, etc. are mentioned. As a processing liquid flight means to make processing liquid fly through space to sensitive material Like the thing of the same structure as the ink-jet head section of an ink jet printer, or the thing of structure given in JP,6-324455,A The thing which makes sensitive material generate [in / the flight means after processing / for processing liquid] a pressure through space, and makes it fly actively, the thing which makes processing liquid fly like a spray bar according to the fluid-pressure force applied to the flight means after processing through space at sensitive material are mentioned. Since what supplies processing liquid by vibration, the thing which supplies processing liquid by bumping are mentioned as a processing liquid flight means to make the processing liquid by the thing of the same structure as the ink-jet head section of an ink jet printer fly through space to sensitive material, the processing liquid amount of supply is controlled and the processing position of Japanese lacquer and sensitive material can also be chosen, it is desirable.

[0016] The liquid supplied through space may fluctuate an amount according to a supply position. Moreover, it is desirable that both pH seven or less strong solution and pH eight or more strong solutions are preferably supplied through space.

[0017] Moreover, the thing by which the thing which supplies processing liquid to sensitive material through space as a processing liquid supply means from a linear supply head, or the thing which supplies processing liquid to sensitive material through space from a field-like supply head also supplies processing liquid to sensitive material through space from a punctiform supply head, or the other methods may be used. When sensitive material is a

sheet, in moreover, the state where the physical relationship of sensitive material and a supply head is being fixed, using the supply head of the shape of a field equivalent to the size of sensitive material. Although processing liquid may be supplied to sensitive material through space from a supply head, even if it is [a supply head] smaller to supply processing liquid to sensitive material through space from a supply head, shifting the physical relationship of a supply head and sensitive material, processing liquid can fully be supplied to sensitive material, and it is desirable. Moreover, in order to supply processing liquid to sensitive material quickly although a supply head may move when using a linear supply head, it is desirable to move sensitive material to a linear supply head in addition to a linear supply head and a linear parallel direction. In order to make the processing time regularity especially, it is desirable to move sensitive material to a linear supply head and a linear perpendicular direction.

[0018] The amount of supply in this invention is processing volume supplied to a direct emulsion side, when it minds space, and when making sensitive material immersed and supplying processing liquid, it points out the amount of supplements of a supplement agent. As for the liquid which contains a color development chief remedy at least, it is desirable that the emulsion side of sensitive material is supplied directly.

[0019] [Development process] The processing liquid for development points out all the liquid containing a compound with the capacity which can contribute to the development reaction of sensitive material, for example, a color development chief remedy, alkali chemicals, etc. by this invention. For example, solution, water, etc. containing a surfactant, the solubilizing agent of a color development chief remedy, preservatives, etc. are included. In this invention, although it consists of at least two processing liquid, pH seven or less strong solution and pH eight or more strong solutions, as for both, it is still more desirable that it is pH 4 or less and pH 10 or more.

[0020] A development process says a thing after supplying the liquid for the first development to sensitive material until it supplies the processing liquid (for example, a bleach fix bath, bleach liquor, the stop solution, etc.) of the following process, or until it floods with the processing liquid of the following process by this invention. Moreover, time to pass a development process is time after supplying the liquid for the first development to sensitive material until it supplies the processing liquid of the following process, or until it floods with the processing liquid of the following process, and is 5 - 20 seconds preferably about 5 to 45 seconds.

[0021] As for the ratio of the amount of supply of pH seven or less liquid and pH eight or more liquid, it is desirable that one side is less than 100-time capacity to another side, and it is less than double precision further less than 10 times more preferably. About 5-150ml per two of amounts to which each is supplied is 10-100ml and further 10-50ml preferably 1m of sensitive material, and about 10-300ml per two of sum total amount of supply of all processing liquid is 10-100ml and further 20-60ml preferably 1m of sensitive material.

[0022] As time when the processing liquid for development is altogether supplied on the image formation side (henceforth an emulsion side) of sensitive material, it is [less than 2/3 of the beginning that passes a development process] desirable that it is less than 1/3 and less than 1/10 more preferably.

[0023] Although it is desirable to make it be proportional to the light exposure to sensitive material as for supply of the processing liquid for development, it is not necessary to make it be not necessarily proportional. Moreover, in the case of color photography sensitive material, the following desirable examples are given as sequence of supply of each part liquid separation.

[0024] (1) color development chief-remedy content liquid → — alkali-chemicals content liquid (2) color development chief-remedy content liquid → alkali chemicals and color development chief-remedy content liquid (3) water → color development chief-remedy content liquid → — alkali-chemicals content liquid (4) Water → color development chief-remedy content liquid → alkali chemicals and color development chief-remedy content liquid (5) alkali-chemicals content liquid → — color development chief-remedy content liquid (6) alkali chemicals and color development chief-remedy content liquid → color development chief-remedy content liquid (7) Water → alkali-chemicals content liquid → color development chief-remedy content liquid (8) In color development chief-remedy content ****, as a desirable example Water → alkali chemicals and color development chief-remedy content liquid - > [(1), (2), (3), and (4) are mentioned and it is (1) and (3) still more preferably.

[0025] As for a color development chief remedy, it is desirable that it is the p-phenylene diamine system compound which has a water-soluble machine. What has the aforementioned water-soluble machine on [at least one] the amino group of a p-phenylene diamine system compound or a benzene nucleus is mentioned. As a concrete water-soluble machine, it is $-(CH_2)_n-CH_2OH$, $-(CH_2)_m-NHSO_2-(CH_2)_nCH_3$, $-(CH_2)_m-O-(CH_2)_n-CH_3$, and $-(CH_2CH_2O)_mCH_2CH_2OH$ (m and n express zero or more integers, respectively). $-COOH$ basis, $-SO_3H$ set, etc. are mentioned as a desirable thing.

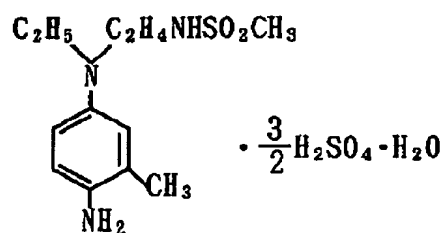
[0026] As an example of the concrete compound preferably used by such color development chief remedy, following (C-1) - (C-18) is mentioned.

[0027]

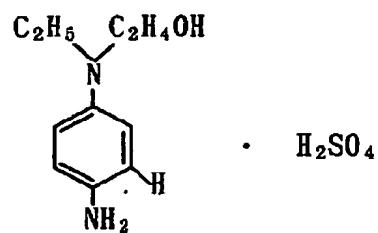
[Formula 1]

[例示発色現像主薬]

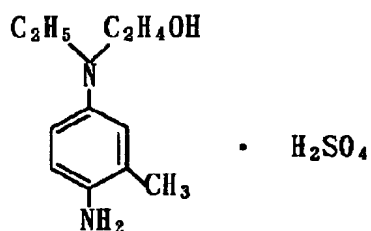
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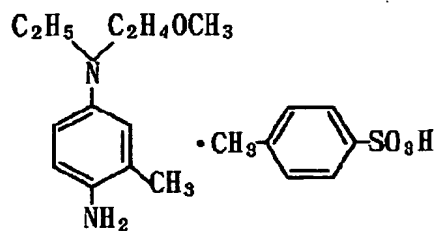
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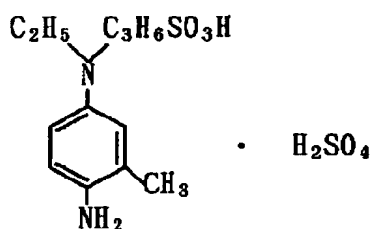
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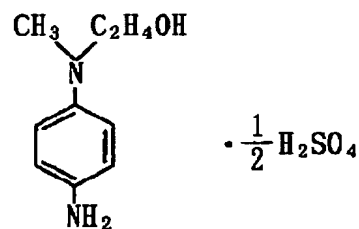
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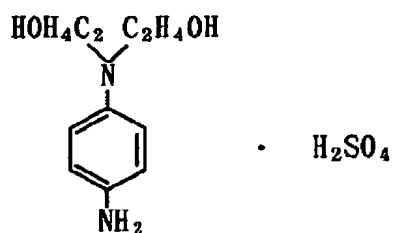
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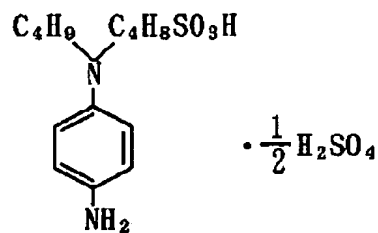
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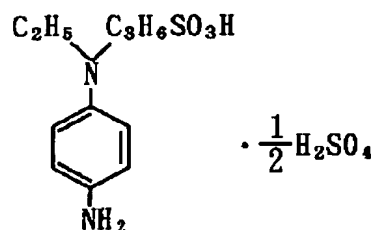
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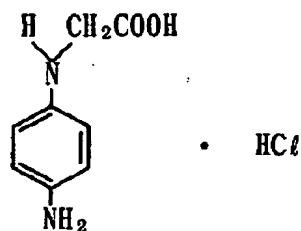
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[Formula 2]

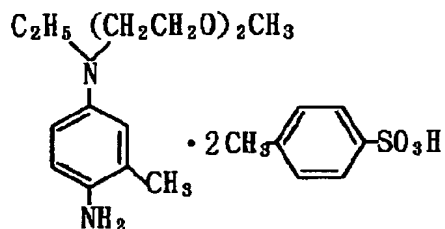
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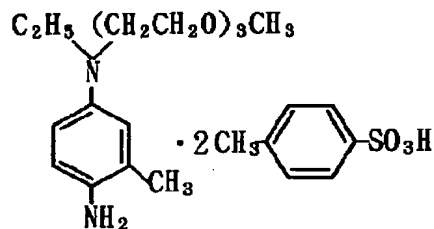
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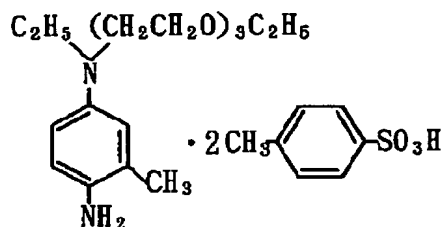
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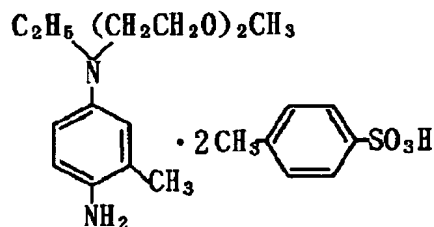
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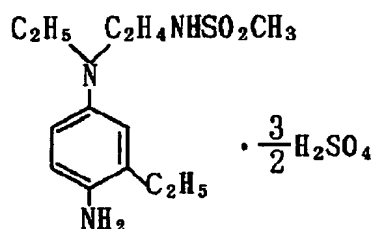
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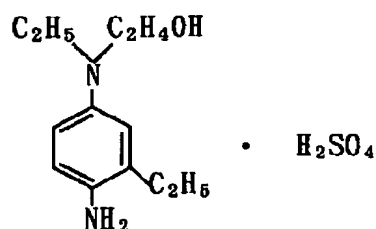
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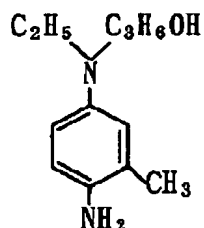
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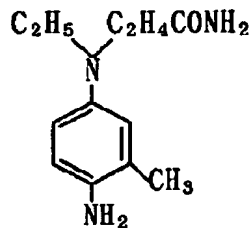
[0029]

[Formula 3]

(C-17)



(C-18)



[0030] the inside of these compounds — a desirable thing — (C-1), (C-2), (C-3), (C-4), and (C-15) — and (C-17) (C-18) — it is .

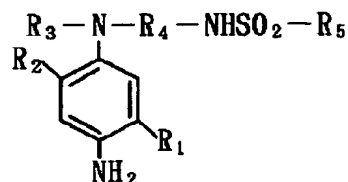
[0031] In addition, the color development chief remedy used preferably is a p phenylenediamine system color

development chief remedy which has the water-soluble machine expressed with the following general formula [P].

[0032]

[Formula 4]

一般式 [P]



[0033] (In a general formula [P], R1 and R2 express a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group, or the acylamino machine.) R3 expresses an alkyl group and R4 expresses an alkylene machine. R5 expresses the alkyl group or aryl group which is not replaced [substitution or].

As an example of these concrete compounds, following compound (C-19) - (C-35) is mentioned. These compounds are shown by the concrete basis of R1-R5 of a general formula [P] being shown.

[0034]

[Formula 5]

	R ₁	R ₂	R ₃	R ₄	R ₅
C-19	-H	-H	-C ₃ H ₇	-CH ₂ CH(-CH ₃)-	-CH ₃
C-20	-NHCOCH ₃	-H	-CH ₃	-CH ₂ CH ₂ -	-CH ₃
C-21	-H	-H	-CH ₃	-CH ₂ CH(-CH ₃)-	-CH ₃
C-22	-CH ₂ CH ₃	-H	-CH ₃	-CH ₂ CH ₂ -	-CH ₃
C-23	-CH ₃	-H	-CH ₃	-CH ₂ CH(-CH ₃)-	-CH ₂ CH ₃
C-24	-CH ₃	-H	-CH ₃	-CH ₂ CH ₂ -	-CH ₂ CH ₃
C-25	-O-CH ₂ CH ₃	-H	-CH ₂ CH ₃	-CH(-CH ₃)CH ₂ -	-CH ₃
C-26	-NHCOCH ₃	-H	-C ₃ H ₇	-CH ₂ CH ₂ -	-CH ₃
C-27	-CH ₃	-H	-CH ₂ CH ₃	-CH ₂ CH ₂ -	-CH ₂ -O-CH ₃
C-28	-H	-H	-CH ₃	-CH ₂ CH ₂ -	-CH ₂ -N-(CH ₃) ₂
C-29	-CH ₃	-H	-CH ₂ CH ₃	-CH ₂ CH ₂ -	-CH ₂ Cl
C-30	-CH ₃	-H	-CH ₂ CH ₃	-CH ₂ CH ₂ -	-CH ₂ -NHCO-CH ₃
C-31	-CH ₂ CH ₃	-H	-CH ₂ CH ₃	-CH ₂ CH ₂ -	-CH ₂ -O-CH ₃
C-32	-CH ₃	-H	-CH ₂ CH ₃	-CH ₂ CH ₂ -	-CH ₂ -O-CH ₂ CH ₃
C-33	-CH ₃	-H	-CH ₂ CH ₃	-CH ₂ CH ₂ CH ₂ -	-CH ₃
C-34	-Cl	-H	-CH ₃	-CH ₂ CH ₂ CH ₂ -	-CH ₃
C-35	-O-CH ₃	-H	-CH ₂ CH ₃	-CH ₂ CH(-CH ₃)-	-CH ₃

[0035] Among the above-mentioned instantiation compounds, preferably, it is (C-20), (C-27), (C-29), (C-30), and (C-33), and is desirable most in all instantiation compounds (C-1). Moreover, the compound of a general formula [P]

is compoundable according to the method of a publication to JP,4-37198,A. The above-mentioned color development chief remedy is usually used in the form of salts, such as a hydrochloride, a sulfate, and a p-toluenesulfonic-acid salt.

[0036] Moreover, the aforementioned color development chief remedy is independent, or it may be used together two or more sorts, and may use together with monochrome developing agent, for example, a phenidone, 4-hydroxymethyl-4-methyl-1-phenyl-3-pyrazolidone, a Metol, etc. by request, and may use.

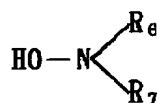
[0037] About 0.005-1.00 mols /of concentration of the chief remedy of the liquid containing a p phenylenediamine system color development chief remedy are [I.] 0.01-0.25 mols [I.] /and further 0.06-0.13 mols/l. preferably. When this concentration is 0.05 mols/l. or more, as for pH of liquid, four or less are desirable from the soluble point of a chief remedy, and it is pH two or less further. Moreover, when this concentration is 0.25 mols/l. or more, it is desirable that pH is two or less.

[0038] It is stable in copy genuineness ability to contain the compound shown by the following general formula [H] or [B] in the processing liquid for the color developments, and fogging produced in the unexposed section also has the advantage of being few.

[0039]

[Formula 6]

一般式 [H]

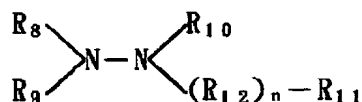


[0040] In a general formula [H], although an alkyl group, an aryl group, an R'-CO-machine, or a hydrogen atom is expressed, respectively, even if the alkyl group R6 and whose R7 are not hydrogen atoms simultaneously and which is expressed with R6 and R7 is the same, they may differ, and its alkyl group of carbon numbers 1-3 is desirable respectively. Furthermore, these alkyl groups may have a carboxylic-acid machine, a phosphoric-acid machine, a sulfonic group, or a hydroxyl group. R' expresses an alkoxy group, an alkyl group, or an aryl group. Also including that in which the alkyl group and aryl group of R6, R7, and R' have a substituent, it may join together, and R6 and R7 may constitute a ring, for example, they may constitute the heterocycle like a piperidine, a pyridine, triazine, or a morpholine.

[0041]

[Formula 7]

一般式 [B]



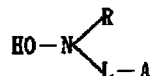
[0042] In a general formula [B], R8, R9, and R10 express the alkyl group which is not replaced [a hydrogen atom, substitution, or], an aryl group, or a heterocycle machine, and R11 expresses the alkyl group which is not replaced [a hydroxy group, the hydroxy amino group, substitution, or], an aryl group, a heterocycle machine, an alkoxy group, an aryloxy group, a carbamoyl group, and the amino group. As a heterocycle machine, it may be 5 - 6 member ring, and saturation or an unsaturation is [it may consist of C, H, O, N, S, and a halogen atom, and] sufficient. R12 expresses the divalent basis chosen from -CO-, -SO2-, or -C(=NH)-, and n is 0 or 1. Especially R11 may express an alkyl group, an aryl group, and the basis chosen from a heterocycle machine at the time of n= 0, and R10 and R11 may form a heterocycle machine jointly.

[0043] Especially the compound shown by the following general formula [D] among the compounds of a general formula [H] is desirable.

[0044]

[Formula 8]

一般式 [D]



[0045] (In a general formula [D], L expresses an alkylene machine, A expresses a carboxyl group, a sulfonic group, a phosphono machine, a phosphinic acid machine, a hydroxyl, the amino group, an ammonio machine, a carbamoyl group, or a sulfamoyl group, and R expresses a hydrogen atom or an alkyl group.) L, A, and R may be replaced by each also in no replacing also including a straight chain and branched chain. L and R may connect and a ring may be formed.

It explains still in detail about the compound shown by the general formula [D]. Among a formula, L expresses the alkylene machine which may replace the straight chain of carbon numbers 1-10, or branched chain, and its carbon numbers 1-5 are desirable. Specifically, bases, such as a methylene, ethylene, trimethylene, and a propylene, are mentioned as a desirable example. As a substituent, a carboxyl group, a sulfonic group, a phosphono machine, a

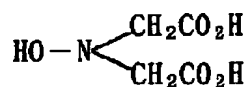
phosphinic acid machine, a hydroxyl, and the ammonio machine that may carry out alkylation are expressed, and a carboxyl group, a sulfonic group, a phosphono machine, and a hydroxyl are mentioned as a desirable example. A expresses a carboxyl group, a sulfonic group, a phosphono machine, a phosphinic acid machine, a hydroxyl or the amino group that may carry out alkylation, an ammonio machine, a carbamoyl group, or a sulfamoyl group, and is mentioned as an example with desirable carboxyl group, sulfonic group, hydroxyl, phosphono machine, and carbamoyl group that may carry out alkylation. - As an example of L-A, a carboxymethyl machine, a carboxy ethyl group, a carboxy propyl group, a sulfoethyl machine, a sulfo propyl group, a sulfo butyl, a phosphono methyl group, a phosphono ethyl group, and a hydroxyethyl machine can be mentioned as a desirable example, and a carboxymethyl machine, a carboxy ethyl group, a sulfoethyl machine, a sulfo propyl group, a phosphono methyl group, and a phosphono ethyl group can be especially mentioned as a desirable example. R expresses the alkyl group which may replace the straight chain of a hydrogen atom and carbon numbers 1-10, or branched chain, and its carbon numbers 1-5 are desirable. As a substituent, a carboxyl group, a sulfonic group, a phosphono machine, a phosphinic acid machine, a hydroxyl or the amino group that may carry out alkylation, an ammonio machine, a carbamoyl group, or a sulfamoyl group is expressed. There may be two or more substituents. As R, a hydrogen atom, a carboxymethyl machine, a carboxy ethyl group, a carboxy propyl group, a sulfoethyl machine, a sulfo propyl group, a sulfo butyl, a phosphono methyl group, a phosphono ethyl group, and a hydroxyethyl machine can mention as a desirable example, and can mention as an example with especially desirable hydrogen atom, carboxymethyl machine, carboxy ethyl group, sulfoethyl machine, sulfo propyl group, phosphono methyl group, and phosphono ethyl group. L and R may connect and a ring may be formed.

[0046] Next, although the typical example of a compound is shown among the compounds expressed with a general formula [D], this invention is not limited to these compounds.

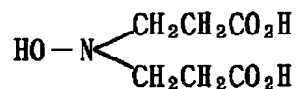
[0047]

[Formula 9]

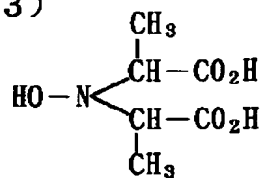
D-(1)



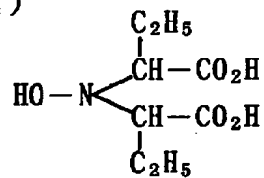
D-(2)



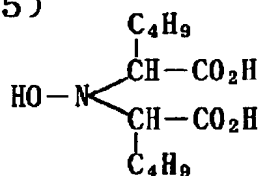
D-(3)



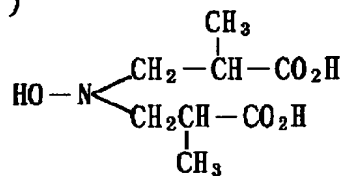
D-(4)



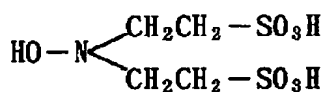
D-(5)



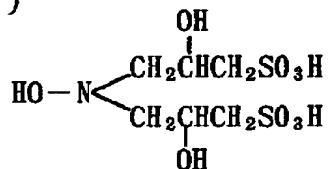
D-(6)



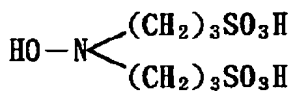
D-(7)



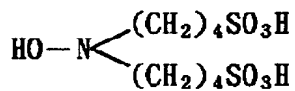
D-(8)



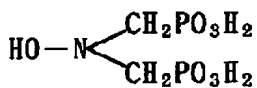
D-(9)



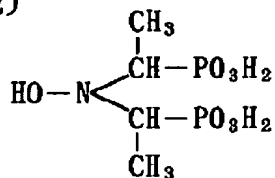
D-(10)



D-(11)



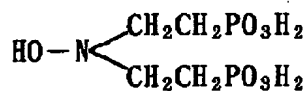
D-(12)



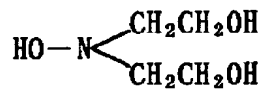
[0048]

[Formula 10]

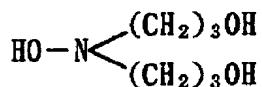
D - (13)



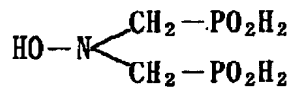
D - (14)



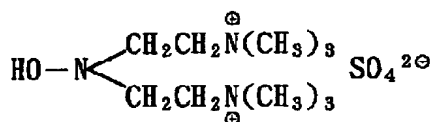
D - (15)



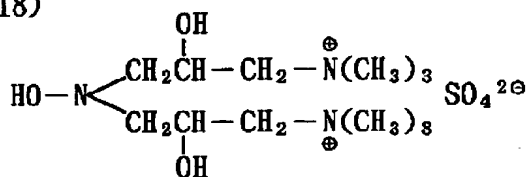
D - (16)



D - (17)



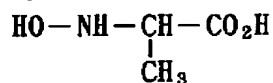
D - (18)

D - (19) $\text{HO}-\text{NH}-\text{CH}_2\text{CO}_2\text{H}$

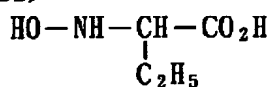
D - (20)



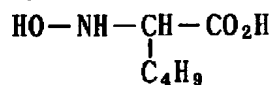
D - (21)



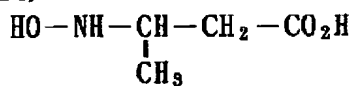
D - (22)



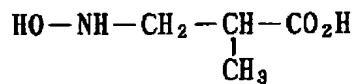
D - (23)



D - (24)



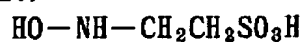
D - (25)



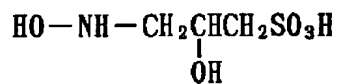
[0049]

[Formula 11]

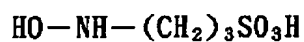
D - (26)



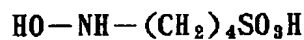
D - (27)



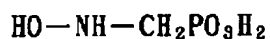
D - (28)



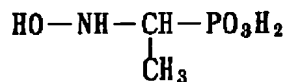
D - (29)



D - (30)



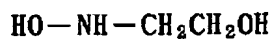
D - (31)



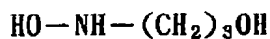
D - (32)



D - (33)



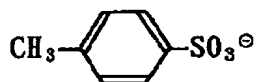
D - (34)



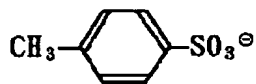
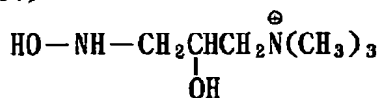
D - (35)



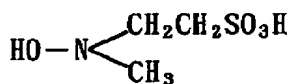
D - (36)



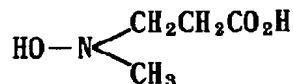
D - (37)



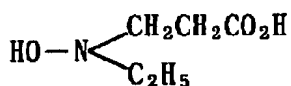
D - (38)



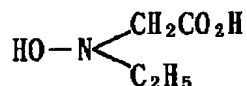
D - (39)



D - (40)



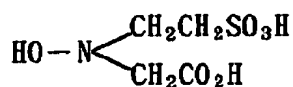
D - (41)



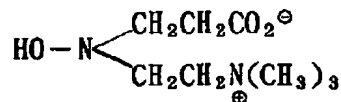
[0050]

[Formula 12]

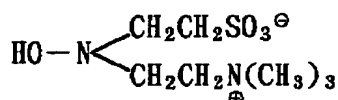
D - (42)



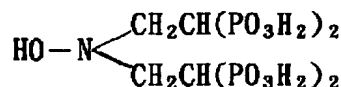
D - (43)



D - (44)



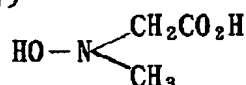
D - (45)



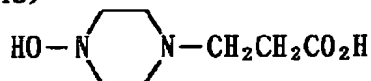
D - (46)



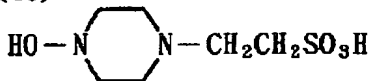
D - (47)



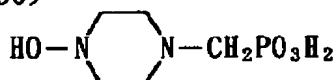
D - (48)



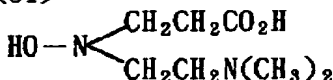
D - (49)



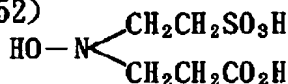
D - (50)



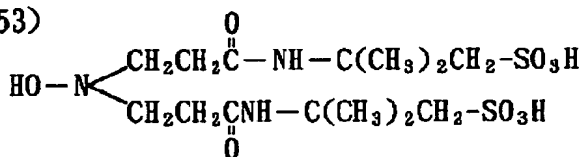
D - (51)



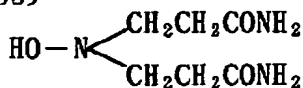
D - (52)



D - (53)


$$\text{D} - (54) \quad \text{HO}-\text{NHCH}_2\text{CH}_2\text{C}(=\text{O})-\text{NHC}(\text{CH}_3)_2-\text{C}(\text{CH}_3)_2-\text{CH}_2-\text{SO}_3\text{H}$$

D - (55)



[0051] The compound shown by these general formulas [H] or the general formula [B] is usually used in forms, such as the amine of isolation, a hydrochloride, a sulfate, a p-toluenesulfonic-acid salt, an oxalate, phosphate, and acetate.

[0052] A sulfite can be used for the processing liquid for the color developments as preservatives. As this sulfite, a sodium sulfite, potassium sulfite, a sodium bisulfite, potassium bisulfite, etc. are mentioned. That may not be right although **'s of a sulfite contained in the same partial liquid as a color development chief remedy is desirable. The concentration of a sulfite has desirable l. in 1×10^{-4} to 5xten - two mols %.

[0053] A buffer can be used for the processing liquid for the color developments, as a buffer Potassium carbonate, a sodium carbonate, a sodium bicarbonate, a potassium bicarbonate, Phosphoric-acid 3 sodium, phosphoric-acid 3 potassium, phosphoric-acid 2 potassium, the sodium borate, A boric-acid potassium, tetraboric-acid sodium (boric acid), a tetraboric-acid potassium, Ortho-hydroxybenzoic-acid sodium (sodium salicylate), an ortho-hydroxybenzoic-acid potassium, A 5-sulfo-2-hydroxy sodium benzoate (5-sodium sulfosalicylate) and a 5-sulfo-2-hydroxybenzoic-acid potassium (5-sulfosalicylic-acid potassium) are desirable.

[0054] Alkali chemicals are used for the processing liquid for the color developments, and a lithium hydroxide, a sodium hydroxide, a potassium hydroxide, etc. are mentioned other than the aforementioned buffer as alkali

chemicals. About 0.1–3.5 mols /of concentration of alkali chemicals are [I.] 0.3–1.2 mols/l. preferably. When alkali chemicals seldom dissolve under the influence of temperature or other solutes, it is desirable to use it in the range of the amount which can be dissolved.

[0055] An accelerator can be used for the processing liquid for the color developments, and a thioether system compound, a p-phenylene diamine system compound, quaternary ammonium salt, para aminophenol, an amine system compound, polyalkylene oxide, 1-phenyl-3-pyrazolidone, hydronalium ion, the Mesoyl-on type compound, an ion type compound, imidazole derivatives, etc. can be added as an accelerator in it if needed.

[0056] As for the processing liquid for the color developments, it is desirable not to contain benzyl alcohol substantially.

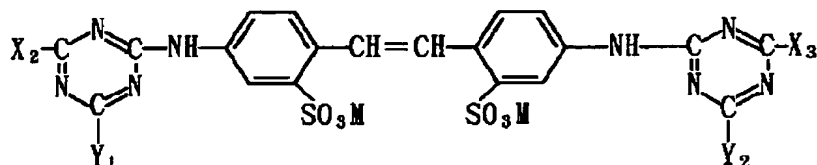
[0057] In the processing liquid for the color developments, a chloride ion and bromine ion can be added for the purpose, such as fogging prevention. When directly added by color development liquid, although the chloride of sodium, a potassium, ammonium, nickel, magnesium, manganese, calcium, or cadmium is mentioned, desirable things are a sodium chloride and potassium chloride as chloride-ion feed materials. Moreover, it may be supplied with the form of the opposite salt of the fluorescent brightener added by color development liquid. As feed materials of bromine ion, although the bromide of sodium, a potassium, ammonium, a lithium, calcium, magnesium, manganese, nickel, cadmium, a cerium, or a thallium is mentioned, desirable things are a potassium bromide and a sodium bromide. Not containing substantially is most desirable although at most 0.02 mols /of contents of these halogen ion are [I.] 0.001 mols/l. or less preferably.

[0058] It is desirable to make the processing liquid for the color developments contain a thoriadinyl stilbene system fluorescent brightener, and the compound specifically shown by the following general formula [E] is desirable.

[0059]

[Formula 13]

一般式 [E]



[0060] Setting at an upper ceremony, X2, X3, Y1, and Y2 are halogen atoms, such as a hydroxyl group, chlorine, or a bromine, an alkyl group, an aryl group, and [0061] respectively.

[Formula 14]



[0062] Or -OR17 is expressed. Respectively, it is here, and in R13 and R14, R15 and R16 express an alkylene machine (a substitution product is included), R17 expresses a hydrogen atom, an alkyl group (a substitution product is included), or an aryl group (a substitution product is included) for a hydrogen atom, an alkyl group (a substitution product is included), or an aryl group (a substitution product is included), and M expresses a cation.

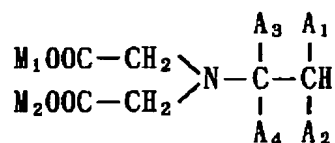
[0063] Furthermore, in addition to this, various additives, such as a stain inhibitor, a sludge inhibitor, and an interlayer effect accelerator, can be used again.

[0064] Moreover, it is desirable that the chelating agent shown in the processing liquid for the color developments by following general formula [K-I]–[K-V] is added.

[0065]

[Formula 15]

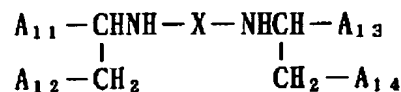
一般式 [K – I]



[0066]

[Formula 16]

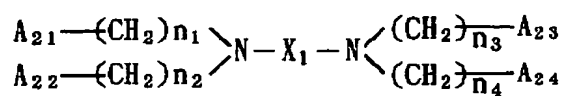
一般式 [K – II]



[0067]

[Formula 17]

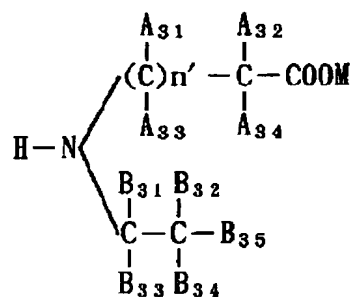
一般式〔K-III〕



[0068]

[Formula 18]

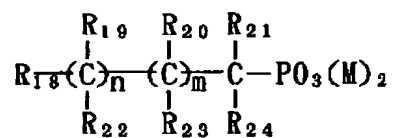
一般式〔K-IV〕



[0069]

[Formula 19]

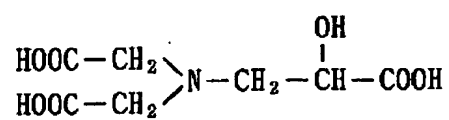
一般式〔K-V〕



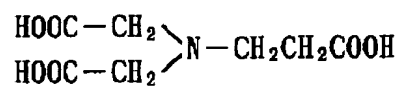
[0070]

[Formula 20]

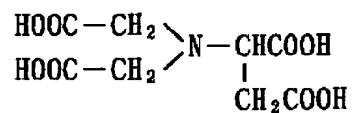
K - I - 1



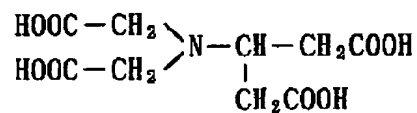
K - I - 2



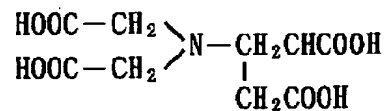
K - I - 3



K - I - 4



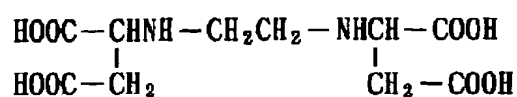
K - I - 5



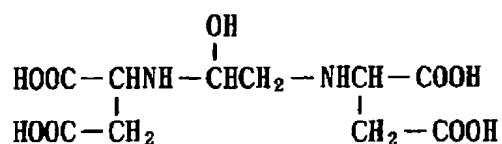
[0071]

[Formula 21]

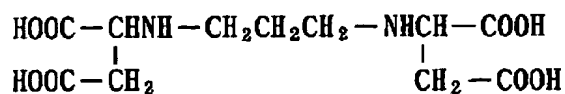
K - II - 1



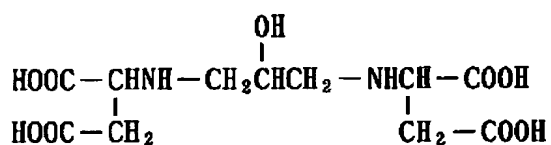
K - II - 2



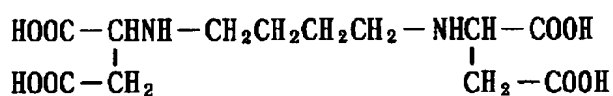
K - II - 3



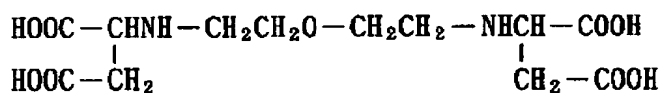
K - II - 4



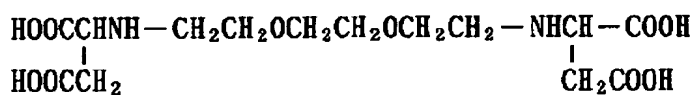
K - II - 5



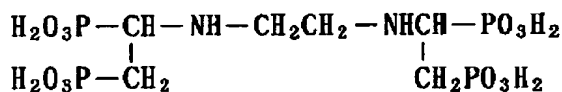
K - II - 6



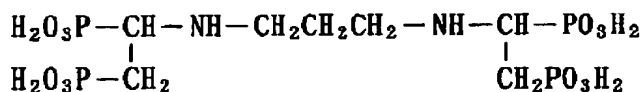
K - II - 7



K - II - 8



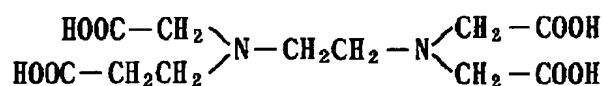
K - II - 9



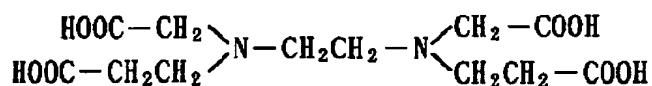
[0072]

[Formula 22]

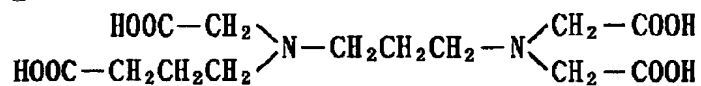
K - III - 1



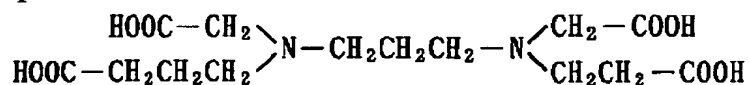
K - III - 2



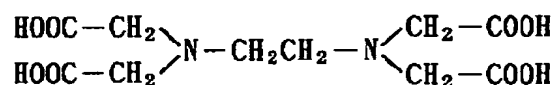
K - III - 3



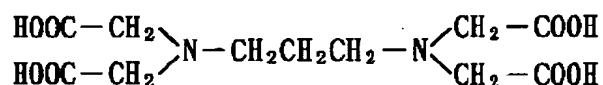
K - III - 4



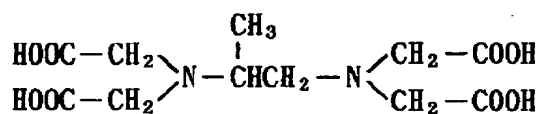
K - III - 5



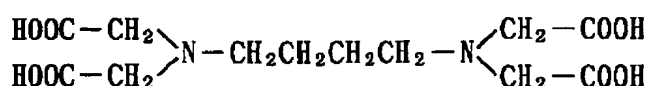
K - III - 6



K - III - 7



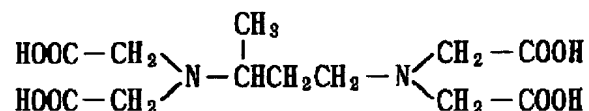
K - III - 8



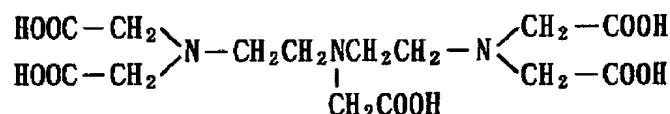
[0073]

[Formula 23]

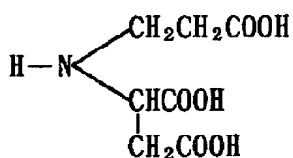
K - III - 9



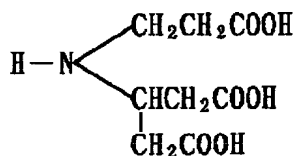
K - III - 10



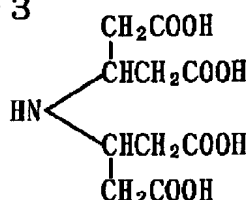
K - IV - 1



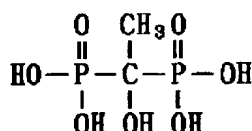
K - IV - 2



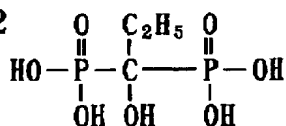
K - IV - 3



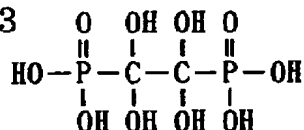
K - V - 1



K - V - 2



K - V - 3



[0074] Also in these chelating agents, it divides and K-I -2, K-II -1, K-II -5, K-III -10, K-IV -1, and K-V -1 are used preferably.

[0075] Furthermore, the processing liquid for the color developments can be made to contain an anion, a cation, both sexes, and the field side activator of a Nonion again, and various surfactants, such as an alkyl sulfonic acid, an aryl sulfonic acid, an aliphatic carboxylic acid, and an aromatic carboxylic acid, may be added if needed.

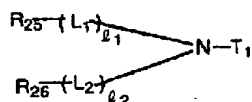
[0076] [Bleaching processing] It is desirable to contain at least one sort of the 2nd iron complex of an amino polycarboxylic acid and hydrate salts in bleaching processing liquid. You may mix and use two or more sorts of different 2nd iron complex of an amino polycarboxylic acid and hydrate salts.

[0077] It is desirable to be used as the 2nd iron complex of an amino polycarboxylic acid as a form of the iron complex of the free acid (compound shown by the following general formula [I]) of an amino polycarboxylic acid shown below, and it is still more desirable to use together the aforementioned 2nd iron complex and the free acid of an amino polycarboxylic acid. Especially a desirable thing is using together the aforementioned 2nd iron complex, and constituting it and the free acid of an amino polycarboxylic acid of the same kind. Moreover, the 2nd ***** hydrate salt of an amino polycarboxylic acid can be used as potassium salt, sodium salt, an ammonium salt, etc., and the free acid of an amino polycarboxylic acid can be used as the acid of isolation, potassium salt, sodium salt, etc.

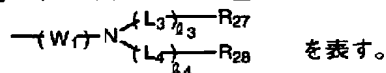
[0078]

[Formula 24]

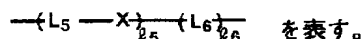
一般式 (I)



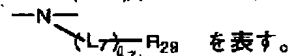
式中、T₁は、水素原子、ヒドロキシ基、カルボキシ基、スルホ基、カルバモイル基、ホスホノ基、ホスホン基、スルファモイル基、置換されていても無置換であってもよいアルキル基、アルコキシ基、アルキルスルホンアミド基、アルキルチオ基、アシルアミノ基、ヒドロキサム酸基ヒドロキシアルキル基、又は、



W₁は、置換されていても無置換であってもよいアルキレン基、アリーレン基、アルケニレン基、シクロアルキレン基、アラルキレン基、又は、



Xは、 $-O-$ 、 $-S-$ 、2価のヘテロ環 又は、



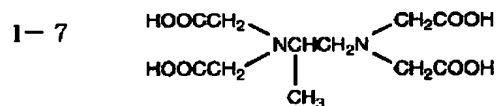
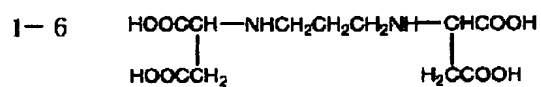
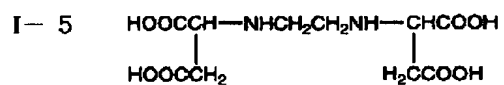
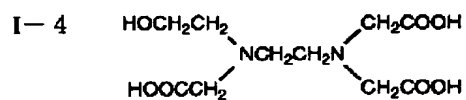
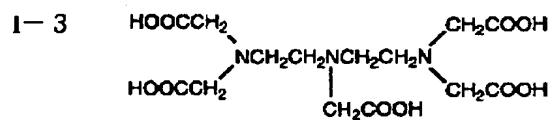
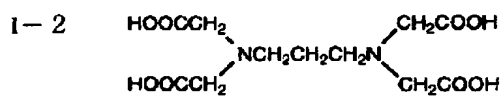
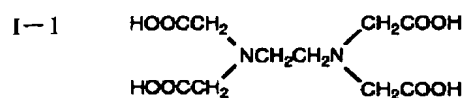
[0079] R₂₅-R₂₉ express a hydrogen atom, a hydroxy group, a carboxy group, a sulfonic group, a carbamoyl group, a phosphono machine, a HOSUHON machine, a sulfamoyl group, a sulfone acid machine, the acylamino machine, and a hydronalium KISAMU machine, and at least one of R₂₅-R₂₉ is a carboxy group.

[0080] L₁-L₇ express the alkylene machine which could be replaced even if replaced, an arylene machine, an alkenylene group, a cyclo alkylene machine, or an aralkylene group. l₁-l₇ express the integer of 0-6. However, l₅-l₆ are not in 0 with a bird clapper simultaneously.

[0081] The concrete instantiation compound of an amino polycarboxylic acid (instantiation compound I) shown by the general formula [I] which constitutes the 2nd iron complex of an amino polycarboxylic acid and a hydrate salt is shown below.

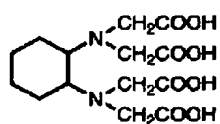
[0082]

[Formula 25]

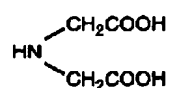


[0083]
[Formula 26]

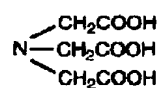
I- 8



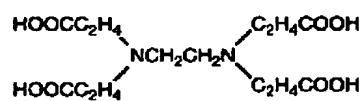
I- 9



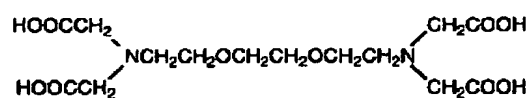
I-10



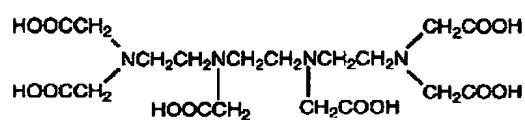
I-11



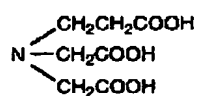
I- 12



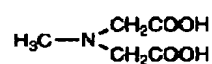
I-13



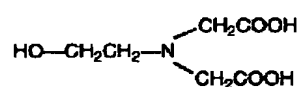
I-14



I- 15



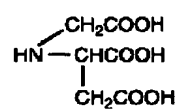
I-16



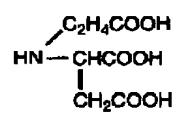
[0084]

[Formula 27]

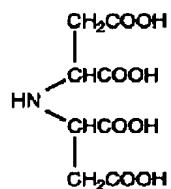
I-17



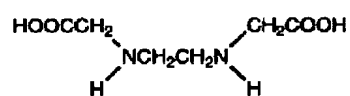
I-18



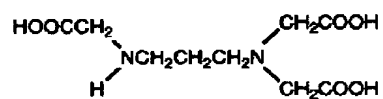
I-19



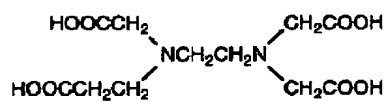
I-20



I-21



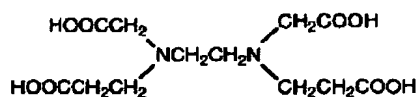
I-22



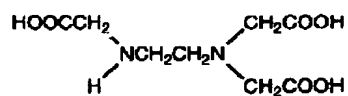
[0085]

[Formula 28]

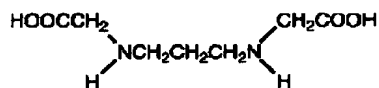
I-23



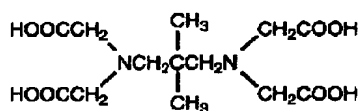
I-24



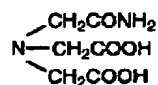
I-25



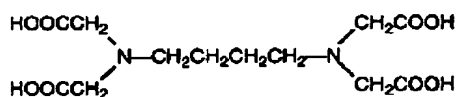
I-26



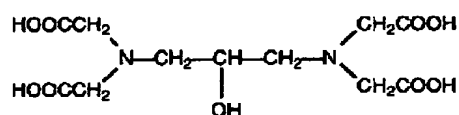
I-27



I-28



I-29



[0086] As a desirable compound, - (I-1) (I-8), (I-12), (I-14) - (I-20), (I-22), (I-23), and (I-27) are mentioned, and (I-1), (I-2), (I-3), (I-6), (I-12), (I-14), (I-15), and (I-17) are especially mentioned as a desirable compound.

[0087] The concrete instantiation compound of the 2nd iron complex of an amino polycarboxylic acid and a hydrate salt (instantiation compound II(s)) is shown below.

[0088]

[Formula 29]

アミノリカルボン酸 Fe(III)錯体 例示化合物Ⅱ類			アミノリカルボン酸 Fe(III)錯体の好ましい結晶水の量
記号	アミノリカルボン酸 (例示化合物Ⅰ類)	対カチオン	Fe 1 mol に対する 結晶水のモル数
Ⅱ-1	Ⅰ-1	Na ⁺	3
Ⅱ-2	◇	K ⁺	2
Ⅱ-3	◇	NH ₄ ⁺	2
Ⅱ-4	Ⅰ-2	Na ⁺	3
Ⅱ-5	◇	K ⁺	1
Ⅱ-6	◇	NH ₄ ⁺	1
Ⅱ-7	Ⅰ-3	K ⁺ , H ⁺	1
Ⅱ-8	◇	NH ₄ ⁺ , H ⁺	1
Ⅱ-9	Ⅰ-5	K ⁺	1
Ⅱ-10	◇	NH ₄ ⁺	1
Ⅱ-11	Ⅰ-14	—	2
Ⅱ-12	Ⅰ-28	K ⁺	1
Ⅱ-13	Ⅰ-26	K ⁺	1
Ⅱ-14	Ⅰ-10	—	1.5
Ⅱ-15	Ⅰ-8	NH ₄ ⁺	2

[0089] Moreover, as for bleaching processing liquid, it is desirable to contain the organic-acid compound shown by the following general formula [A].

[0090] General formula [A]

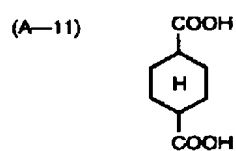
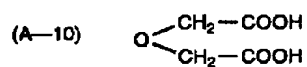
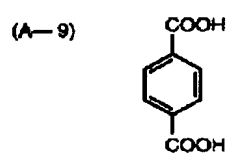
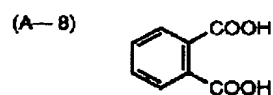
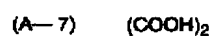
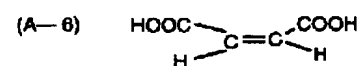
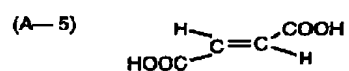
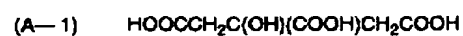
A' expresses the organic machine of n ** among an A'(-COOM) n formula, n expresses the integer of 1-6, and M expresses ammonium, alkali metal (sodium, a potassium, lithium, etc.), or a hydrogen atom.

[0091] In a general formula [A], as an organic machine of n ** expressed with A' An alkylene machine (a methylene group, an ethylene, a trimethylene machine, tetramethylen machine, etc.), Alkenylene groups (ETENIREN machine etc.), alkynylene group (ethynylene group etc.), Cyclo alkylene machines (1, 4-cyclohexane diyl machine, etc.), arylene machines (o-phenylene group, p-phenylene group, etc.), alkane Trier machines (1, 2, 3-propane Trier machine, etc.), and arenetriyl machines (1, 2, 4-benzene Trier machine, etc.) are mentioned.

[0092] The basis of n ** expressed with A' described above contains what has substituents (a hydroxy group, an alkyl group, halogen atom, etc.) (2-hydroxy - 1, 2-dihydroxyethylene, hydroxy ethylene, 1, 2, 3-propane Trier, a methyl-p-phenylene, a 1-hydroxy-2-chloroethylene, a chloro methylene, chloroethenylene, etc.). The desirable example of the compound shown by the general formula [A] below is shown.

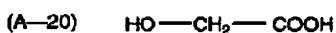
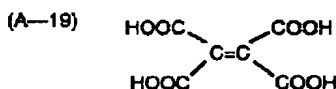
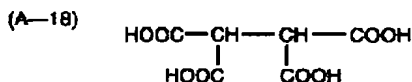
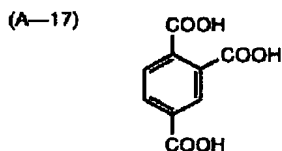
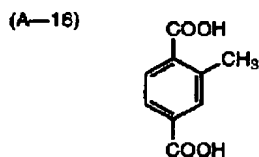
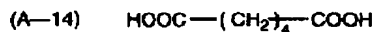
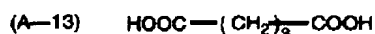
[0093]

[Formula 30]



[0094]

[Formula 31]



[0095] Especially a desirable thing in the above instantiation compound An instantiation compound (A-1), It is (A-3), (A-4), (A-5), (A-6), (A-13), (A-14), (A-15), and (A-20), and (A-1), (A-5), (A-6), (A-13), (A-14), and (A-20) are especially desirable. Moreover, as a salt of the aforementioned acid, although an ammonium salt, lithium salt, sodium salt, potassium salt, etc. are mentioned, sodium salt and potassium salt are desirable from a viewpoint of preservation stability. It can also use independently and these organic acid or its salt can also use two or more sorts together.

[0096] Moreover, in bleaching processing liquid, you may contain a re-halogenating agent. Although a thing well-known as a re-halogenating agent can be used, compounds, such as an ammonium bromide, a potassium bromide, a sodium bromide, potassium chloride, a sodium chloride, an ammonium chloride, a potassium iodide, a sodium iodide, and an ammonium iodide, are mentioned, for example.

[0097]

[Example] Although an example is given and this invention is explained in detail hereafter, the mode of this invention is not limited to this.

[0098] Example 1 drawing 1 is the outline block diagram of the principal part of the auto-processor (henceforth an automatic processor) used here. The perspective diagram of the principal part of this auto-processor is shown in drawing 2. Moreover, drawing 3 is a perspective diagram near the feed-hopper dryness prevention means of this auto-processor.

[0099] [Equipment] There are the heating drum 11 besides the conveyance roller which is not illustrated, the sticking-by-pressure belt 15, the heating belt 33, a conveyance roller after a bleaching fixing processing tub, etc. as a conveyance means to convey the silver-halide photosensitive material P by the predetermined bearer rate. And it has a sensitive-material detection means 70 to detect existence of sensitive material P in the predetermined position of the conveyance direction upstream of a conveyance means, rather than the point to which the processing liquid supply means 52 supplies processing liquid. And there is a heating means 10 to heat the silver-halide photosensitive material P in the conveyance path lower stream of a river of the sensitive material P of the sensitive-material detection means 70. There is a heating drum 11 in the heating means 10. Moreover, the outlet side roller 12 is in the heating drum 11 bottom. The entrance-side roller 13 is in the left-hand side of the heating drum 11. The sticking-by-pressure belt driving roller 14 is in the entrance-side roller 13 bottom on the left-hand side of the outlet side roller 12. The heating drum 11 is made to stick by pressure and convey sensitive material P by moving, while the outlet side roller 12, the entrance-side roller 13, and the sticking-by-pressure belt driving roller 14 are built over the sticking-by-pressure belt 15, it is brought into the 90-degree section of the peripheral surface of the heating drum 11 and is stuck to the heating drum 11 by pressure. Sensitive material P is heated by these.

[0100] The development means 50 is in the conveyance path lower stream of a river of the sensitive material P of the heating drum 11. The development means 50 has the first processing liquid container 51 and the second processing liquid container 56 as a processing liquid container which holds the processing liquid (processing liquid for the color developments) which processes sensitive material P. The first processing liquid container 51 and the second processing liquid container 56 are sealed to the open air. The supply head later mentioned as a processing liquid supply means 52 in this example is used. Thereby, the processing liquid supply means 52 supplies processing

liquid (processing liquid for the color developments) to the emulsion side of the sensitive material P heated by the heating means 10 through space. Moreover, there is a circulating pump 54 in the left of the second processing liquid container 56 in the upper part of the first processing liquid container 51, a filter 55 is in the septum of the first processing liquid container 51 and the second processing liquid container 56, and the processing liquid for the color developments is circulated in the direction shown in the arrow of drawing 1 from the first processing liquid container 51 by operating a circulating pump 54 in order of a circulating pump 54, the second processing liquid container 56, and a filter 55. Moreover, a rotator 57 rotates in the second processing liquid container 56, and stirs the processing liquid in the second processing liquid container 56.

[0101] By this, it will be prepared between the processing liquid supply means 52 from the second processing liquid container 56, and will have a filtration means (filter 55) to filter the processing liquid from the second processing liquid container 56. Moreover, a replenisher is supplied to the second processing liquid container 56 from the replenisher supply means 59.

[0102] The first shutter 62 and the second shutter 64 which are stopped in the middle of are formed in the processing liquid supply means 52 in supply of the processing liquid to a supply head. [the cross direction of sensitive material P] The first shutter 62 is driven by the first shutter mechanical component 61 free [insertion secession on the supply way of the processing liquid to a supply head], and drives the second shutter 64 free [insertion secession] on the supply way of the processing liquid to a supply head by the second shutter mechanical component 63. Drawing 2 shows the state where the second shutter 64 was inserted in the supply way of the processing liquid to a supply head.

[0103] Under the processing liquid supply means 52, in order to prevent dryness of the processing liquid in the feed hopper of the supply head of the processing liquid supply means 52, when not supplying processing liquid to sensitive material P, the feed-hopper dryness prevention means 80 which covers with the lid of the feed hopper of a supply head is. The feed-hopper dryness prevention means 80 has the movable lid 81, the bearing bar 82 supporting the movable lid 81, and the motor 83 to which a bearing bar 82 is moved up and down. A rack drives a bearing bar 82 up and down by the motor 83 on a motor 83 at a bearing bar 82 preparing a pinion. Although the processing liquid supply means 52 supplies processing liquid periodically also in the standby operating condition which does not process sensitive material P so that the movable lid 81 may be a cross-section concave-like and it may mention later In this case, it prevents that surrounding equipment becomes dirty with this processing liquid by the movable lid's 81 moving downward a little, receiving the processing liquid supplied from the processing liquid supply means 52, letting the hole which was prepared into the bearing bar 82 and which is not illustrated pass, and discharging processing liquid to a waste liquid part.

[0104] A second heating means 30 to heat sensitive material P is in the conveyance path downstream of the sensitive material P of the place to which processing liquid is supplied by the processing liquid supply means 52 through space. There are the heating roller 31, the drive roller 32, and a heating belt 33 in the second heating means 30. The heating roller 31 and the drive roller 32 are built over the heating belt 33. The heating roller 31 is in the conveyance path downstream of the previous sensitive material P with which processing liquid is supplied by the processing liquid supply means 52 through space, and heats the heating belt 33. The drive roller 32 which is in the conveyance path downstream of sensitive material P from the heating roller 31 makes the heating belt 33 drive. This heats sensitive material P, where the heating belt 33 is heated. And the second heating means 30 will heat the silver-halide photosensitive material by which processing liquid was supplied to the emulsion side by the processing liquid supply means 52 through space.

[0105] Then, bleaching fixing processing is carried out with the bleaching fixing processing cistern BF, and stabilizing treatment of the sensitive material P in which color development processing was carried out by the development means 50 is carried out by the stabilizing treatment tub ST.

[0106] The outline block diagram of the principal part of an automatic processor which has the two aforementioned development meanses 50 is shown in drawing 4. In this example, the case where it processes using the automatic processor shown by drawing 1 is made into an art 1, and let the case where it processes using the automatic processor shown by drawing 4 be an art 2.

[0107] Drawing 5 is the schematic diagram of the processing tank part of the automatic processor for immersing development which can supply two kinds of processing liquid for the color developments. After sensitive material P is exposed, they are conveyed with a pair of delivery roller, and is first processed by the development tub CD 1. [two or more] It is conveyed one by one by the late-coming color development tub CD 2, the bleaching fixing processing tub BF, and the stabilization tub STB by the roller conveyance means, and is processed, respectively. It dries by the dryer part and the sensitive material P to which these processings of each were performed is discharged outside the plane. Let processing using this automatic processor be an art 3.

[0108] Drawing 6 is the schematic diagram of the automatic processor of the type which sensitive material P is made to flood with the processing liquid of the processing tub CD 2, and supplies other partial liquid, after supplying the partial liquid of the processing liquid for the color developments to sensitive material P through space by the processing liquid supply means CD 1. After color development processing, after bleaching fixing processing and stabilizing treatment are performed to sensitive material P, it dries and it is discharged outside the plane. Let processing using this automatic processor be an art 4.

[0109] Drawing 7 is the schematic diagram of the automatic processor which can be supplied to the emulsion side of sensitive material P through space, after mixing two kinds of processing liquid for the color developments. Let processing using this automatic processor be an art 5.

[0110] [Processing liquid supply means] A linear supply head is used for drawing 1 and the processing liquid supply means of the auto-processor of 4, 6, and 7. This linear supply head is perpendicular to the conveyance direction of sensitive material P. The array of a feed hopper is a staggered arrangement of a biseriate. The interval of a feed hopper is 100 micrometers in the distance between edges with the maximum proximity feed hopper. For the diameter of 100 micrometers (7.85x10 to 9 m area 2) of a feed hopper, the processing liquid amount of supply per two is 25ml in 50ml and arts 2 and 4 at arts 1 and 5 the 5000 number of times of processing liquid supply for 1 second, and 1m of silver-halide photosensitive material.

[0111] [Sensitive material] Konica QA-A, Inc. 6 paper exposed by the usual method is processed.

[0112] [processing liquid prescription: It is] perl.

<<color development liquid - 1>>

Sodium-sulfite 15.0g4-amino-3-methyl-N-ethyl 0.2g screw (sulfoethyl) hydroxylamine disodium 12.0g diethylenetriamine pentaacetic acid 5 sodium 3.0g polyethylene-glycol #4000 8.0g potassium carbonate 45.0gp-toluenesulfonic acid sodium - N - (beta- (methanesulfon amide))

Ethyl aniline sulfate (CD-3) pH is adjusted to 10.0 using 10.0g potassium hydroxide or a sulfuric acid.

[0113] <<color development liquid - 2>>

Partial liquid A sodium sulfite 0.4g diethylenetriamine pentaacetic acid 5 sodium 3.0g polyethylene-glycol #4000 6.0gp-toluenesulfonic acid sodium 30.0gCD-3 It adjusts to pH given in a table using 40.0g potassium hydroxide or a sulfuric acid.

[0114] Partial liquid B diethylenetriamine pentaacetic acid 5 sodium 3.0g polyethylene-glycol #4000 10.0g potassium carbonate It adjusts to pH given in a table using 90.0g potassium hydroxide or a sulfuric acid.

[0115] <<bleaching fixing and stabilizing treatment process>>

Konica [Corp.] make: It carried out using the processing agent for the said processes on the processing conditions of CPK-2-J1 process.

[0116] The color paper was processed for three consecutive weeks at a rate of 2 10m per day using drawing 1 and the auto-processor of 4, 5, 6, and 7. To the art 1, it processed in color development processing-time 10 seconds using color development liquid -1. The replenisher used color development liquid -1 as it was. To arts 2 and 5, it processed in color development processing-time 10 seconds using color development liquid -2. The replenisher used partial liquid A and B as they were. Moreover, at the art 2, the supply interval was supplied in 0.3 seconds in order of partial liquid A and partial liquid B.

[0117]

Processing condition [of the color development process of the <<art 3 >>]

Processing liquid supply means Used solution Processing time Processing temperature Amount of supply (second) (degree C) (ml/m2)

CD1 Color development liquid-2 partial liquid A 5 39.5 25 (pH 1.5)

CD2 Color development liquid-2 partial liquid B 5 39.5 25 (pH 13.0)

KCl3.7g/l. addition, in addition the processing time here are time after flooding sensitive material with processing liquid until it floods with the following processing liquid.

[0118]

Processing condition [of the color development process of the <<art 4 >>]

Processing liquid supply means Used solution Processing time Processing temperature Amount of supply (second) (degree C) (ml/m2)

CD1 Color development liquid-2 partial liquid A - - 25 (pH 1.5)

CD2 Color development liquid-2 partial liquid B 5 39.5 25 (pH 13.0)

5 seconds after supplying color development liquid-2 partial liquid A from the processing liquid supply means CD 1 through KCl3.7 g/l addition space, you made it immersed in the processing tub CD 2.

[0119] Replenisher>> used with CD1 and CD2 of the <<art 3, and CD2 of an art 4

replenisher for partial liquid A - a sodium sulfite perl. 0.6g diethylenetriamine pentaacetic acid 5 sodium 4.3g polyethylene-glycol #4000 8.6g para toluenesulfonic acid sodium 42.9gCD-3 replenisher for 64.0g partial liquid B - perl. - diethylenetriamine pentaacetic acid 5 sodium 4.3g polyethylene-glycol #4000 14.3g potassium carbonate At the time of 129.0g consecutive-processing start, the sample was processed after one week, two weeks, and three weeks, and the maximum blue reflection density Dmax (Y) and (440nm) were measured. [Dmin (C), (660nm) and] [the part light reflex concentration Dmin of 440nm and 660nm of the unexposed section (Y), (440nm),]

[0120] Moreover, it saved at the room temperature for two weeks, putting the partial liquid A and B of color development liquid -2 into a processing container or a processing tub, this container and tub after preservation were observed, and the following criteria estimated.

[0121] O : - although **:sludge as which a sludge is not regarded although muddiness of O:liquid with which a sludge is not seen at all is checked is slightly checked by the oil level, x:sludge which is a satisfactory grade is seen considerably

[0122] Furthermore, in the art 2, pH of the partial liquid A and B of color development liquid -2 was changed as shown in Table 1, and it evaluated similarly.

[0123] The above result is shown in Table 1.

[0124]

[Table 1]

実験 No.	処理 方法	発色現像液 -2のpH		開始時			1週間後			2週間後			3週間後			処理容器、 処理槽の様子		主薬 残存率 (%)	備考
		部分 液A	部分 液B	Dmax (Y)	Dmin (Y)	Dmin (C)	Dmax (Y)	Dmin (Y)	Dmin (C)	Dmax (Y)	Dmin (Y)	Dmin (C)	Dmax (Y)	Dmin (Y)	Dmin (C)	CD 1	CD 2		
1	1	—	—	1.23	0.06	0.09	1.21	0.06	0.10	1.20	0.07	0.10	1.18	0.08	0.12	—	—	85	比較例
2	2	1.5	13.0	2.27	0.05	0.06	2.26	0.05	0.06	2.25	0.05	0.06	2.25	0.05	0.06	⊙	⊙	98	本発明
3	3	1.5	13.0	2.25	0.05	0.06	2.08	0.08	0.08	2.06	0.10	0.10	2.04	0.12	0.12	△	△	92	"
4	4	1.5	13.0	2.25	0.05	0.06	2.23	0.06	0.07	2.20	0.06	0.09	2.16	0.07	0.10	⊙	○	98	"
5	5	1.5	13.0	1.98	0.05	0.07	—	—	—	—	—	—	—	—	—	⊙	⊙	98	比較例
6	2	4.0	13.0	2.18	0.05	0.06	2.17	0.05	0.06	2.15	0.06	0.06	2.14	0.06	0.07	⊙	⊙	95	本発明
7	2	6.0	14.0	2.07	0.05	0.09	2.07	0.05	0.09	2.06	0.06	0.09	2.05	0.06	0.09	○	⊙	91	"
8	2	6.0	13.0	2.16	0.05	0.06	2.15	0.05	0.06	2.13	0.05	0.06	2.12	0.06	0.07	○	⊙	91	"
9	2	6.0	9.0	1.85	0.04	0.05	1.84	0.05	0.05	1.83	0.05	0.06	1.83	0.06	0.06	○	○	91	"
10	2	6.0	7.0	0.14	0.00	0.00	0.14	0.00	0.00	0.14	0.00	0.00	0.14	0.00	0.00	○	×	91	比較例
11	2	7.0	13.0	2.14	0.06	0.07	2.12	0.06	0.07	2.13	0.06	0.08	2.10	0.07	0.08	△	⊙	89	本発明
12	2	8.0	13.0	1.95	0.06	0.15	1.91	0.10	0.16	1.86	0.15	0.18	1.80	0.18	0.21	×	⊙	73	比較例

[0125] In addition, since the blinding of a processing liquid supply means occurred on the 2nd day of the consecutive processing, consecutive processing was stopped by the art 5.

[0126] Sufficient concentration is obtained, fogging is also suppressed low and by supplying pH seven or less liquid and pH eight or more liquid to a sample, respectively, and mixing them directly from Table 1, shows that generating of a sludge can be prevented. Moreover, pH of the liquid containing a color development chief remedy is four or less, and it is a book.

[0127] Furthermore, stable consecutive processing can be performed, by making it the method with which both mind space, the shelf life of processing liquid also improves and by supplying at least one of the two of both strong solutions to sensitive material through space shows that it is desirable.

[0128] the 440nm spectrum of the maximum blue reflection density Dmax (Y) (440nm) and the unexposed section of the sample at the time of the consecutive-processing start which the amount of supply was changed as shown in Table 2, and processed it like the example 1 about example 2 art 2 — reflection density Dmin (Y) and a 660nm spectrum — reflection density Dmin (C) was measured A result is shown in Table 2.

[0129]

[Table 2]

実験 No.	処理 方法	発色 現像液	発色現像液 - 2 の pH		発色現像液の 供給量 (ml / m ²)			Dmax (Y)	Dmin (Y)	Dmin (C)	備考
			部分 液 A	部分 液 B	部分 液 A	部分 液 B	合計				
13	2	2	1.5	13	25	5	30	2.05	0.04	0.04	本発明
14	2	2	1.5	13	25	25	50	2.27	0.05	0.06	"
15	2	2	1.5	13	25	100	125	2.16	0.05	0.06	"
16	2	2	1.5	13	25	140	165	2.05	0.05	0.06	"
17	2	2	1.5	13	25	160	185	2.01	0.06	0.06	"
18	2	2	1.5	13	100	25	125	2.04	0.06	0.06	"
19	2	2	1.5	13	100	100	200	2.25	0.06	0.07	"
20	2	2	1.5	13	100	140	240	2.08	0.06	0.07	"
21	2	2	1.5	13	100	160	260	2.06	0.08	0.09	"
22	2	2	1.5	13	140	100	240	2.20	0.06	0.08	"
23	2	2	1.5	13	140	140	280	2.14	0.07	0.09	"
24	2	2	1.5	13	140	160	300	2.09	0.09	0.10	"
25	2	2	1.5	13	160	100	260	2.22	0.10	0.10	"
26	2	2	1.5	13	160	140	300	2.21	0.10	0.10	"
27	2	2	1.5	13	160	160	320	2.16	0.10	0.10	"

[0130] By this, when the amount of supply of each liquid to sensitive material is 5 - 150 ml/m², required concentration is obtained, and it turns out that fogging is suppressed low.

[0131] In example 3 art 2, the concentration of the color development chief remedy of the partial liquid A of color development liquid -2 was changed as shown in Table 3, and the maximum blue reflection density Dmax (Y) (440nm)

and the part light reflex concentration Dmin of 660nm of the unexposed section (C) of the sample at the time of the consecutive-processing start which set pH of partial liquid B to 13.0, and processed it like the example 1 was measured. Moreover, it was saved at -5 degrees C, enclosing partial liquid A with a processing container, and 3, 10, 20, and 30 days after, the container was observed and the following criteria estimated low-temperature deposit nature. A result is shown in Table 3.

[0132] O A sludge is x by which the sludge was checked ten days [from which the sludge was checked 20 days / which will not be checked / after O:] after **: also after [of :] 30 days. : The sludge was checked three days after.

[0133]

[Table 3]

実験 No.	発色現像液の pH		発色現像主薬の濃度		Dmax(Y)	Dmin(C)	低温析出性	備考
	部分液 A	部分液 B	g / l	mol / l				
28	1.5	13.0	2	0.0046	2.02	0.04	◎	本発明
29	1.5	13.0	5	0.011	2.05	0.04	◎	本発明
30	1.5	13.0	30	0.069	2.23	0.05	◎	本発明
31	1.5	13.0	40	0.092	2.27	0.05	◎	本発明
32	1.5	13.0	50	0.11	2.25	0.06	◎	本発明
33	1.5	13.0	100	0.23	2.15	0.06	◎	本発明
34	1.5	13.0	200	0.46	2.10	0.06	○	本発明
35	1.5	13.0	400	0.92	2.08	0.07	○	本発明
36	1.5	13.0	450	1.03	2.01	0.09	△	本発明

[0134] If pH of the partial liquid A of color development liquid -2 is made or less into seven and concentration of a color development chief remedy is carried out [l.] in 0.005-1.00 mols /by this, it turns out that the problem of a deposit does not occur even if required concentration is obtained, and fogging is small and being saved at low temperature.

[0135] It is made to change, as the color development chief remedy of example 4 color-development liquid -2, the concentration of potassium carbonate, and the amount of supply of each liquid are shown in Table 4. Except having adjusted pH of partial liquid A and partial liquid B to 1.5 and 13.0, respectively the 440nm spectrum of the maximum blue reflection density Dmax (Y) (440nm) and the unexposed section of the sample at the time of the consecutive-processing start processed like the example 1 -- reflection density Dmin (Y) and a 660nm spectrum -- reflection density Dmin (C) was measured

[0136] A result is shown in Table 4.

[0137]

[Table 4]

実験 No.	主薬濃度 (g / l)	炭酸カリウムの 濃度 (g / l)	処理液供給量 (ml/ml)			Dmax(Y)	Dmin(Y)	Dmin(C)	備考
			部分液 A	部分液 B	比率				
37	400	400	2.5	2.5	1	2.02	0.06	0.05	本発明
38	400	400	2.5	5	2	2.09	0.06	0.05	本発明
39	400	400	2.5	25	10	2.18	0.06	0.05	本発明
40	400	400	2.5	100	25	2.14	0.06	0.05	本発明
41	400	400	2.5	250	100	2.05	0.08	0.07	本発明
42	400	400	2.5	300	120	2.04	0.10	0.09	本発明
43	40	90	25	25	1	2.27	0.05	0.06	本発明
44	40	90	25	50	2	2.21	0.05	0.06	本発明
45	40	90	25	250	10	2.12	0.07	0.08	本発明
46	40	90	25	275	11	2.09	0.09	0.10	本発明

[0138] Table 4 shows that required concentration can be obtained and fogging can be low suppressed if the ratio of

the amount of supply of low pH liquid and high pH liquid is in the range of 1-100 by capacity.

[0139] Except having changed the color development processing time, as shown in Table 5, and having adjusted pH of the partial liquid A and B of color development liquid -2 to 1.5 and 13.0 in example 5 art 2, respectively the 440nm spectrum of the maximum blue reflection density Dmax (Y) (440nm) and the unexposed section of the sample at the time of the consecutive-processing start processed like the example 1 — reflection density Dmin (Y) and a 660nm spectrum — reflection density Dmin (C) was measured A result is shown in Table 5.

[0140]

[Table 5]

実験No.	処理時間 (秒)	Dmax(Y)	Dmin(Y)	Dmin(C)	備考
47	4	1.98	0.04	0.04	本発明
48	5	2.08	0.04	0.05	本発明
49	10	2.27	0.05	0.06	本発明
50	30	2.28	0.05	0.06	本発明
51	40	2.27	0.07	0.07	本発明
52	50	2.27	0.10	0.11	本発明

[0141] Table 5 shows that required concentration can be obtained and fogging can be low suppressed if development time is made into the range for 5 - 45 seconds.

[0142] It is made to change in example 6 art 2, as the concentration of the potassium carbonate of the partial liquid B of color development liquid -2 is shown in Table 6. Except having adjusted pH of partial liquid A and partial liquid B to 1.5 and 13.0, respectively the 440nm spectrum of the maximum blue reflection density Dmax (Y) (440nm) and the unexposed section of the sample at the time of the consecutive-processing start processed like the example 1 — reflection density Dmin (Y) and a 660nm spectrum — reflection density Dmin (C) was measured Moreover, low-temperature deposit nature was evaluated like the example 3 about partial liquid B. A result is shown in Table 6.

[0143]

[Table 6]

実験No.	炭酸カリウム濃度		Dmax(Y)	Dmin(C)	低温析出性	備考
	g / ℓ	mol / ℓ				
53	10	0.072	2.04	0.05	◎	本発明
54	15	0.11	2.16	0.05	◎	本発明
55	50	0.36	2.23	0.06	◎	本発明
56	90	0.66	2.27	0.06	◎	本発明
57	160	1.16	2.24	0.06	◎	本発明
58	450	3.26	2.08	0.07	○	本発明
59	500	3.62	2.01	0.09	△	本発明

[0144] Table 6 shows that a good result can be obtained if concentration of the alkali chemicals of high pH liquid is made into 1, 0.1-4.5 mols / ℓ, and high concentration.

[0145]

[Effect of the Invention] By this invention, it excels in dry feeling at quick processability, and the shelf life of development liquid can also obtain the art of a good silver-halide photosensitive material.

[Translation done.]

* NOTICES *

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The outline block diagram of the principal part of the auto-processor used in the example.

[Drawing 2] The perspective diagram of the principal part of the auto-processor of drawing 1 .

[Drawing 3] The perspective diagram near the feed-hopper dryness prevention means of the auto-processor of drawing 1 .

[Drawing 4] The outline block diagram of the principal part of the auto-processor which has two development meanses.

[Drawing 5] The schematic diagram of the processing tank part of the automatic processor for immersing development which can supply two kinds of processing liquid for the color developments.

[Drawing 6] Another side is the schematic diagram of the color development section of the automatic processor with which one side immerses for it and supplies two kinds of processing liquid for the color developments through space.

[Drawing 7] The schematic diagram of the automatic processor which can be supplied to the emulsion side of sensitive material through space after mixing two kinds of processing liquid for the color developments.

[Description of Notations]

10 Heating Means

11 Heating Drum

30 Second Heating Means

33 Heating Belt

50 Development Means

51 First Processing Liquid Container

52 Processing Liquid Supply Means

54 Circulating Pump

55 Filter

56 Second Processing Liquid Container

57 Rotator

70 Sensitive-Material Detection Means

80 Feed-Hopper Dryness Prevention Means

[Translation done.]

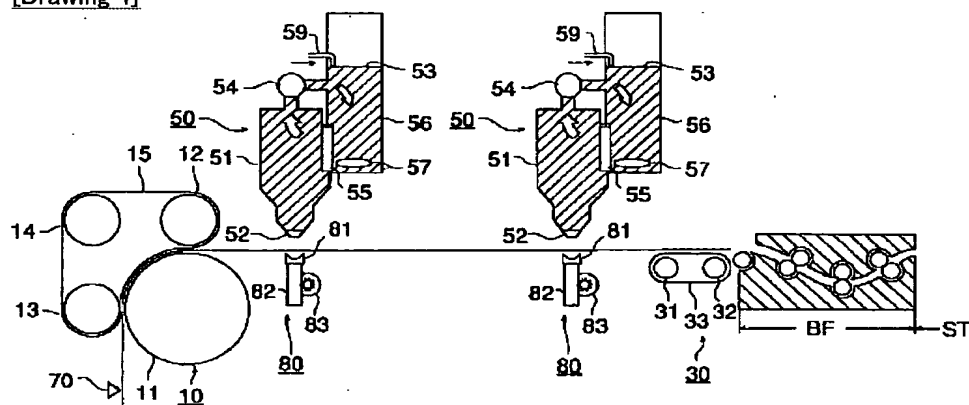
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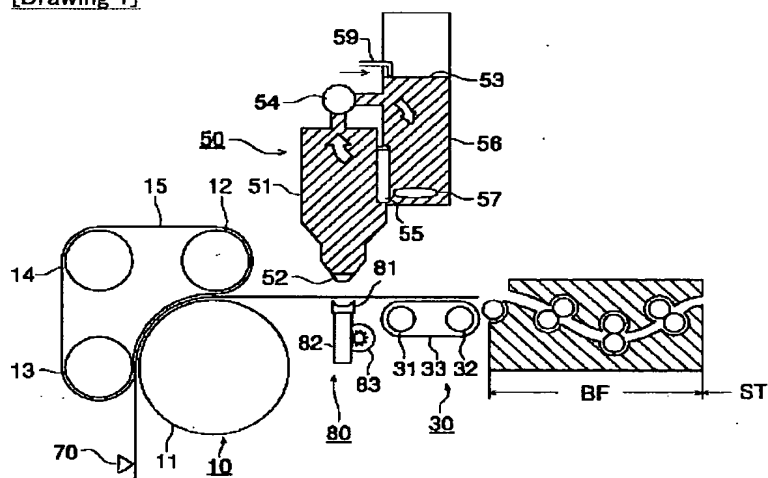
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DRAWINGS

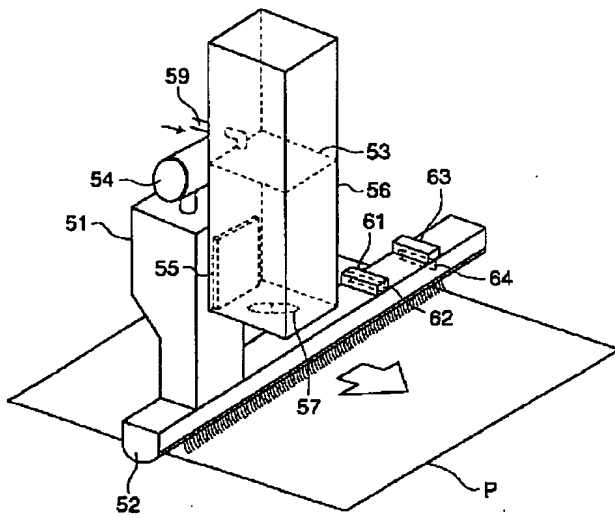
[Drawing 4]



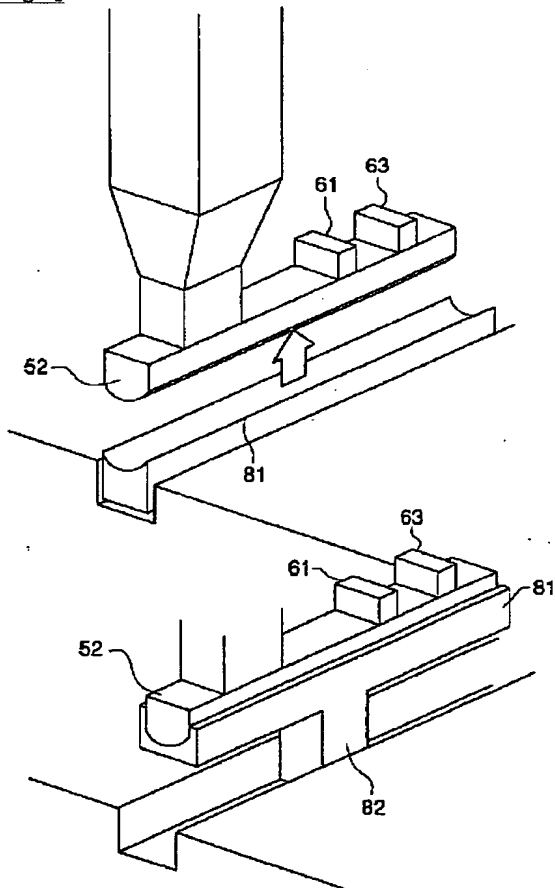
[Drawing 1]



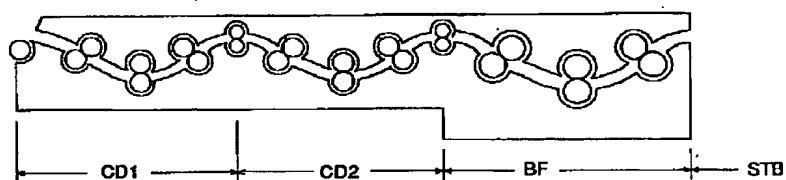
[Drawing 2]



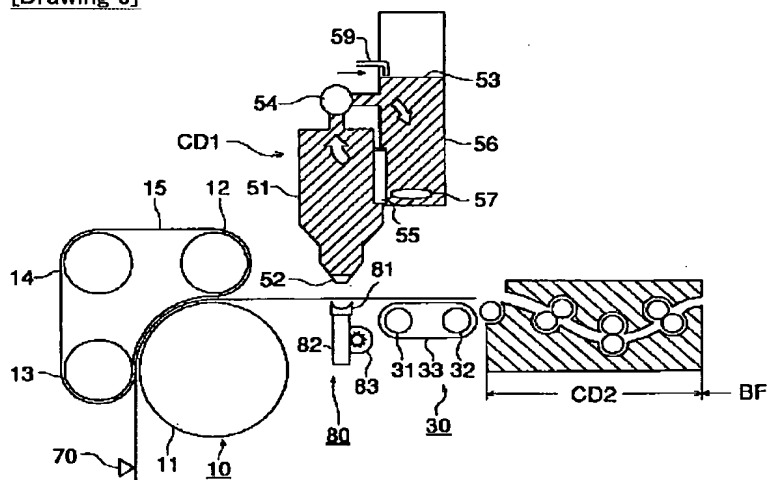
[Drawing 3]



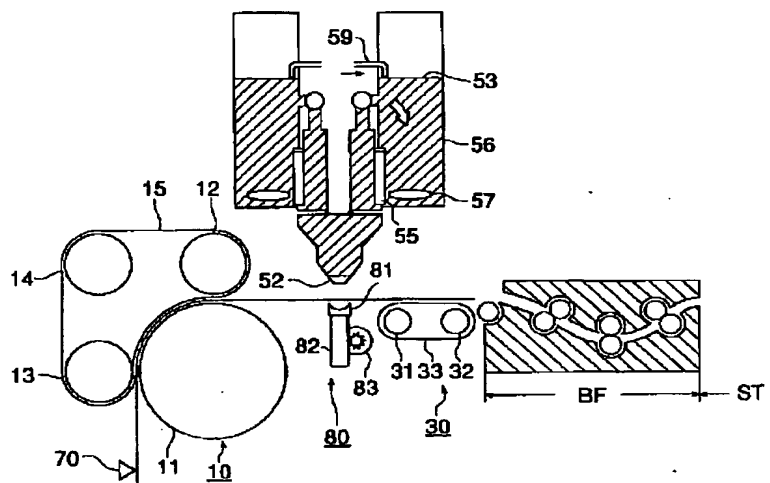
[Drawing 5]



[Drawing 6]



[Drawing 7]



[Translation done.]